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This report gives full documentation and serves as a user's manual for INDEX.PLOT, a FORTRAN computer program designed to calculate the Pollutant Standards Index (PSI). This computer program which was originally developed to test the structure of PSI, has now been expanded as a general purpose program which can compute daily index values for a month, a season, a year, or longer.

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A FORTRAN PROGRAM FOR COMPUTING THE POLLUTANT STANDARDS INDEX (PSI)

by

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FOREWORD

Monitoring activities provide the most important quantitative information available on the state-of-the-environment, thereby yielding a scientific measure of the impact of environmental regulatory actions. To generate valid monitoring data, research is necessary to evaluate and improve measuring instruments and techniques, develop criteria for designing monitoring networks, carry out effective statistical analyses of monitoring data, and give technical support to field monitoring activities. The Environmental Protection Agency's (EPA's) Office of Research and Development (ORD) carries forward a broadly based national research program in air pollution, water pollution, and other environmental topic areas. Within the ORD, the Office of Monitoring and Technical Support oversees research and policies concerned with monitoring quality assurance, evaluation of measurement methods, application of advanced monitoring techniques, and development of improved methods for analyzing and handling environmental data.

This report is intended to provide technical aids that will assist State and local agencies in computing a nationally uniform air pollution index, the Pollutant Standards Index. Use of this index by air pollution control agencies is covered under regulations that will be promulgated by EPA in August 1978, as required by the Clean Air Act Amendments of 1977 (P.L. 95-95).

ABSTRACT

This report gives full documentation and serves as a user's manual for INDEX.PLOT, a FORTRAN computer program designed to calculate the Pollutant Standards Index (PSI). The PSI was proposed in the Federal Register in September 1976 by the Environmental Protection Agency as a nationally uniform air pollution index and is intended for use by State and local air pollution control agencies under Section 319 of the Clean Air Act. This computer program, which was originally developed to test the structure of PSI, has now been expanded as a general purpose program which can compute daily index values for a month, a season, a year, or longer. The program consists of 563 FORTRAN statements and contains seven specialized subroutines. By use of the subroutines, the main program: lists the raw data, along with any data set labels; inventories missing values in the data set; plots a time series graph of PSI values on the line printer; calculates statistics for PSI (mean, standard deviation, range, coefficients of skewness and kurtosis); and generates and plots a frequency distribution of PSI values, along with cumulative frequencies, on the line printer. A complete listing of the program is given, along with sample outputs and descriptions of each subroutine. This program can be used for describing air quality trends, comparing data from different monitoring stations, and developing environmental quality profiles.

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I. INTRODUCTION

In May 1974, Thom and Ott[1] began a national survey of existing air pollution indices--those in the literature and those used by air pollution control agencies. From the survey findings, they identified the structural characteristics for a nationally uniform air pollution index.[2,3] In September 1976, the EPA formally adopted a recommended nationally uniform air pollution index based upon this original structure--the Pollutant Standards Index (PSI).[4,5] The history of the PSI's development, along with examples of its application to data and the theoretical basis for various air and water pollution structures, has been documented in a recent book.[6]

The PSI was intended to be used by State and local air pollution control agencies for reporting air quality data to the public on a daily basis. At that time, although its use by air pollution agencies was completely optional, a number of agencies adopted it.[7] With passage of the Clean Air Act Amendments of 1977, the PSI has been given greater importance. Section 309 of the Clean Air Act Amendments[8] requires that a national air quality monitoring system be established using a uniform air quality index.

During the development of the PSI, a special FORTRAN computer program, INDEX.PLOT, was written to evaluate the index and to test the effect of changing various breakpoints. Once the characteristics of the index were finalized, INDEX.PLOT was modified so that it could be used as a general purpose program to calculate the PSI from existing air quality data. A study by Ott and Hunt[9] used INDEX.PLOT to evaluate the performance of the PSI with air quality data from eight United States cities.

The present report was written to serve as a user's manual for INDEX.PLOT. Thus, it contains the final version of the program, full documentation of the software, and samples of its output with actual air quality data. This computer program is particularly useful for displaying air quality data over relatively long time periods (a month, a season, or a year) or for comparing air quality levels at different monitoring locations. A companion document[10] has been prepared to assist users in rapidly calculating the PSI on a daily basis without a computer. Examples of applications of PSI to data from various United States cities can be found in the literature on this topic.[6,9,11]

II. STRUCTURE OF THE PROGRAM

The complete program, INDEX.PLOT, is listed in Appendix A. It contains over 700 lines, with 563 FORTRAN statements. Many comments are included internally within the program to assist the user in understanding the program steps or in making changes in the software. The logic of the program is relatively simple and should be easy for the user to follow.

The overall program consists of a main program which calls seven subroutines:

1. TITLE
2. PRINT
3. CHECK
4. PSI
5. TOTAL
6. STAT
7. HISTOG

Each subroutine performs an independent function, although some subroutines depend upon the output from the preceding ones.

The principal function of the main program is to read the data file, storing the information in various arrays. For example, the raw observations of pollutant concentrations are stored by the main program in the two-dimensional array STORE. Once they are stored, the subroutine PRINT lists the raw data so that the user can examine the input values. The subroutine TITLE merely reads and writes out any titles that accompany the raw data. The subroutine CHECK inventories the missing values by pollutant and prints the result in tabular form. Next, the PSI and all its subindices are computed by the PSI subroutine. For each input record, a graphical time series plot of the PSI value, along with the critical pollutant and a descriptor word, is printed on the line printer by the PSI subroutine. This subroutine also counts the number of records for which at least one pollutant is present (i.e., nonmissing records) and stores the result in N. Then the subroutine TOTAL is executed to count the number of different descriptor words for each subindex, including the PSI, and the number of critical pollutants. Next, the subroutine STAT is executed, which

computes basic statistics for the PSI values, such as the mean, standard deviation, coefficients of skewness and kurtosis. Finally, the subroutine HISTOG generates a plot of the histogram of the PSI values on the line printer, along with a listing of the individual and cumulative frequencies. In the present version of the program, the histogram interval width is 5 PSI units, and the full histogram range is 5(100) = 500 PSI units. Any PSI value which exceeds 500 is listed immediately after the histogram is printed. In the United States, a PSI value above 500 is a very rare occurrence and generally denotes an error.

MAIN Program

The MAIN Program begins by initializing J, which is intended as a counter to count the number of records read (J = 1 for the first record). A "record" consists of a line of data, in card image format, with the date and five air pollutants always listed in the following order: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and total suspended particulates (TSP). See Section III for details about the input data format. The vectors LINE(100) and MSUM(7,6) then are cleared, and a code for missing values, Z, is set. In the data read for this example (Appendix C), each missing value is coded as Z = 999.99. Of course, Z can be set to any other numerical value, depending upon the coding system established for the data. Missing values must be dealt with in this fashion so that they will not be erroneously treated as zeros and accidentally included in the calculation of the mean and other statistics.

The READ statement then reads values for ITEST (a code for the beginning and end of the file), ID (6 integer values of date: month, day, and year), and STORE (5 floating pollutant values: CO, O_3, NO_2, SO_2, and TSP). If a title is to be read in with the data, the title (not to exceed 80 alphanumeric characters) is inserted in columns 1-80 just before the first data record. This title record must be preceded by a line containing "11" in columns 1-2. Whenever such a line is encountered, ITEST = 11 causes the TITLE subroutine to be executed, which reads the title, stores it in LINE(80), and writes it out again. As many title lines as desired may be included before the data, and these will be printed on the first page of the output to assist the user in identifying the run. At the end of all data, a "99" must be entered in column 1-2 to indicate that the end of the file has been reached. When this record is encountered, ITEST = 99 causes execution to transfer to Statement #900 of the MAIN Program, and computation begins.

As each data record is read, the pollutant concentrations on the record are stored in the first five "columns" of the two-dimensional array STORE(400,6), with the product TSP x SO_2 stored in the sixth column. Each "row" of this array usually corresponds to a day of the year and, therefore, only the first 365 rows of this array usually are filled. Thus, for the first record (first day of the data set), the five pollutants are stored in STORE(1,k), where k = 1,2,...,5. Next, the product TSP x SO_2 is computed by multiplying STORE(1,4) x STORE(1,5) and storing the result into STORE(1,6). If either STORE(1,4) or STORE(1,5) contains Z, the code for a missing value, then STORE(1,6) also is set to Z, denoting that the product also is missing. For each record, the PRINT subroutine then is executed.

This subroutine prints the date and the values for six pollutants, including the product. The record counter J is printed also, giving the user an index to facilitate comparison of different dates. As with other parts of the program, not more than 400 records (usually 365 are used to cover a year of data) can be printed. Once the data are printed for a given record, the record counter J is incremented by 1, and execution returns to Statement #1.

FORMAT Statement #100 governs the manner in which the data are read into the program. In the version of the program listed in Appendix A, the concentration data are input as five real values (F7.2 format), beginning at column 22 and separated by one column each. For other data formats, Statement #100 should be modified.

When the end of file code is encountered (ITEST = 99), execution transfers to Statement #900. The actual number of records (days) read is stored in NSUM = J-1. The computations then are carried out from the MAIN Program by executing various subroutines.

In the present version of the program, the units are set manually. If different combinations of units are used in successive runs, the user may wish to modify the input section of the program so that the units can be set automatically on each run from codes contained within the data.

Arrays

The arrays in INDEX.PLOT are used by the MAIN Program and its subroutines for the following purposes:

- LINE(100): Stores the alphanumeric label that identifies each data set. Stores the alphanumeric characters that are used to print each line of the PSI time series plot. Stores the alphanumeric characters that are used to print each line of the histogram.
- XI(100): Stores the abscissa of the histogram, as computed from the subroutine HISTOG.
- JHIST(100): Stores the number of PSI observations per histogram interval, as computed from the subroutine HISTOG.
- PVAL(100): Stores the frequencies of PSI values per histogram interval, as computed from the subroutine HISTOG.
- CUMVAL(100): Stores the cumulative frequencies of PSI values per histogram interval, as computed from the subroutine HISTOG.

- HIVAL(100): Stores any individual PSI values that exceed the range of the histogram, as computed from the subroutine HISTOG.

- STORE(400,6): Stores up to 400 records of raw data (6 pollutants per record) and is filled during execution of the MAIN Program.

- VALUE(400): Stores up to 400 PSI values, as computed in the PSI subroutine. No PSI value is stored in this array if, for any record, all pollutants are missing.

- ID(400,6): Stores up to 400 dates, one for each record in which the date consists of 6 integer values (month, 2 digits; day, 2 digits; year, 2 digits). This array is filled during execution of the MAIN Program.

- IUNITS(5): Stores a code for the units in which the pollutants are expressed, one integer value for each of five pollutants (CO, O_3, NO_2, SO_2, and TSP). Here, ug/m^3 is coded as "1"; mg/m^3 as "5"; and ppm as "7". These values are established in the MAIN Program.

- MSUM(7,6): Stores the number of PSI values falling into each descriptor category. For MSUM(I,M), I denotes the variable as follows: CO (I=1), O_3 (I=2), NO_2 (I=3), SO_2 (I=4), TSP (I=5), TSP x SO_2 (I=6), PSI (I=7), and M denotes the descriptor category: "Good" (M=1), "Moderate" (M=2), "Unhealthful" (M=3), "Very Unhealthful" (M=4), "Hazardous" (M=5), and "Total" (M=6).

- SUB(7): Stores the six subindex values and the PSI value and is used for temporary storage in subroutine PSI.

- L(400): Stores a code to identify the pollutant with the maximum subindex (i.e., the "critical pollutant"). These codes are determined during execution of the subroutine PSI.

- NC(7): Stores the number of times each critical pollutant appears and is computed in the subroutine TOTAL.

- P(7): Stores the percentage of times that each critical pollutant appears and is computed in the subroutine TOTAL.

The following sections discuss the subroutines and subprograms in INDEX.PLOT. A total of seven subroutines is called by the MAIN Program.

Subprogram BLOCK DATA

The subprogram BLOCK DATA is necessary to store the alphanumeric characters in common storage. For example, MARK1 and MARK2 denote the symbols "*" and "+", respectively, for use in graphing the individual and cumulative frequencies in the histogram generated by the subroutine HISTOG. If the user wishes to change "+" to "C" in this histogram to depict the cumulative frequencies more clearly, he merely changes the symbol within the single quotation marks to read MARK2/'C '/.

Subroutine TITLE

The subroutine TITLE reads and writes out a title which usually occurs at the beginning of each data set just before the data begin. The title can be omitted or included. If it is included, each line of the title must be preceded by a record containing "11" in column 1-2. This code tells the program that the next line is to be read and printed as a title and does not contain data. The title can contain any alphanumeric character but must not exceed 80 characters.

Subroutine PRINT

The subroutine PRINT (J,ID,STORE) prints the input data so that the user can examine his raw data. For each integer value of J, it prints a single line of output containing the date, along with six pollutant concentration values (CO, O_3, NO_2, SO_2, TSP, and TSP x SO_2). The date is printed as six integer characters from the array ID(400,6), and the pollutants are printed as six floating numbers from the array STORE(400,6). The subroutine cannot print more than 400 lines, and the usual data set consists of 365 lines, one for each day of the year.

Subroutine CHECK

The subroutine CHECK (NSUM,STORE,Z) carries out an inventory of missing values in the array STORE(400,6). In the program listed in Appendix A, missing values are coded as Z = 999.99, and, therefore, this subroutine is actually counting up the number of 999.99's in the data set, by pollutant. Because NSUM is the total number of records (i.e., days) available, this subroutine simply goes through the STORE array on a pollutant-by-pollutant basis, counting up the number of missing values. Then, it prints the count for each pollutant. The count for the product TSP x SO_2, since it depends upon the availability of two other pollutants, is not included.

Subroutine PSI

The subroutine PSI (J,N,STORE,VALUE,IUNITS,MSUM,SUB,L) calculates the PSI values. It is called for each individual record (i.e., day). For example, for the first record, J = 1 and each of the six pollutants is obtained from the first row in the STORE array. The CO concentration is obtained from this row as T = STORE(1,1). If T = Z, a missing value for CO has been encountered, and the CO subindex computation is skipped (i.e., GO to 13). If the CO value is present, a test is carried out to determine whether the concentration is expressed in volumetric units, IUNITS(1) = 5, or gravimetric units, IUNITS(1) = 7. If the concentration is in gravimetric units (mg/m^3 for CO), the top portion of the program is executed (beginning at Statement #11). If the concentration is in volumetric units (ppm), the lower portion of the program is executed (beginning at Statement #12). This general procedure is repeated for all pollutants in the computation section, between Statements #11 and #63 of this subroutine.

After Statement #63 is executed, the results of the computation section are analyzed. The subindex values first are stored in the first six elements of the vector SUB(7). Then, PSI is computed using the AMAX1 function, which determines the maximum of the six elements, and is stored as the seventh element of SUB. By testing to see which of the six subindex values equals PSI in the DO loop ending at Statement #65, the critical pollutant is identified, and a code for the critical pollutant is stored in the array L(400). The codes are as follows:

POLLUTANT	CODE
CO	1
O_3	2
NO_2	3
SO_2	4
TSP	5
TSP x SO_2	6

The maximum subindex, which is the PSI value, is stored in the array VALUE(400), with the statement VALUE(N) = T. The value of N is a count of the number of valid PSI values stored in this array (i.e., missing values are not included), and N is incremented just before each PSI value is stored.

This subroutine prints the time series graph on the line printer. First, markers in the form of alphabetic characters "I", are stored in the alphanumeric vector LINE(100) at intervals of 20 characters each. This is accomplished by the DO loop ending at Statement #70. Then the

subindices are sorted into the five PSI intervals, and the number of values in each interval is tabulated, by pollutant variable, and stored in the array MSUM(7,6). The seven rows of this array denote the six pollutants plus the PSI value, and the first five columns contain the number of descriptor words in each of the following PSI ranges. (The sixth column is reserved for the totals that are computed later in the subroutine TOTAL).

Interval Code	Descriptor	PSI Value
M = 1	Good	$T \leq 50$
M = 2	Moderate	$50 < T \leq 100$
M = 3	Unhealthful	$100 < T < 200$
M = 4	Very Unhealthful	$200 \leq T < 300$
M = 5	Hazardous	$300 \leq T$

Because each character on the line printer corresponds to 5 PSI units, the PSI values are divided by 5.0, and converted to an integer through the statement K = IFIX(T/5.0). For any subindex that exceeds 100, an alphabetic pollutant character is inserted at the appropriate point in the vector LINE(100); that is, in LINE(K). The pollutant characters that are inserted are as follows:

Pollutant Character	Variable	Pollutant
"C"	MARKC	CO
"O"	MARKO	O_3
"N"	MARKN	NO_2
"S"	MARKS	SO_2
"T"	MARKT	TSP
"P"	MARKP	TSP x SO_2

The pollutant code for the PSI "critical pollutant" is stored in the variable MEM, so it can be printed on the line printer as a time series graph. Five possible formats are used in printing this graph, depending upon the value of MEM (Statements #81, #82, #83, #84, and #85). The format for each statement uses a different descriptor word. Once the vector LINE has been used, it is cleared by setting all of its elements equal to the alphanumeric character for a blank, IBLANK. (These alphanumeric characters

defined earlier in the BLOCK DATA subprogram.) If all subindices have ing values, no PSI values can be calculated, and execution bypasses analysis section and transfers to Statement #15 at the end of the PSI outine, where FORMAT #220 is executed. This format prints a line of line printer graph in which PSI = 0, and there is no pollutant code no descriptor word.

outine TOTAL

The subroutine TOTAL(MSUM,L,NSUM,NC,P) generates summary information t the number of values falling in each PSI descriptor word range, by lutant. The results are expressed both as integer totals and as centages. A summary of the critical pollutants also is presented. The lts of this subroutine appear in three tables on a single page of ut. Before TOTAL is executed, the number of observations by subindex by descriptor word already are stored by the subroutine PSI in the y MSUM(I,M). In this array, I denotes the pollutant code (in which 7 denotes PSI), and M denotes the interval code (for M = 1,2,...,5, as ed in the above table).

The total number of descriptor words for each subindex is first puted and stored in the sixth column (M = 6) of the array MSUM. Then the ber of words, by descriptor category, is printed for each subindex. The ber of words, by descriptor category for PSI itself, is printed last--from seventh row of the MSUM array (I = 7). Next, the number of values within h subindex and descriptor category is divided by the total number of ues and multiplied by 100 to give a percentage distribution by descriptor d and pollutant. This makes it possible to produce PSI bars (see Section) and other frequency plots quite easily.

Finally, the critical pollutant codes stored in the vector L(400) are entoried by this subroutine. This inventory is accomplished by setting L = L(I) for each record from I = 1 to I = NSUM, inclusive. Then, the ber of times that IVAL = 1, IVAL = 2, IVAL = 3, etc. is counted and red in the first six elements of the vector NC(7) to denote the critical lutant. IVAL = 7 denotes a missing value. The elements of NC are then med, the percentages are computed, and the number of values and centages, by pollutant, are printed.

routine STAT

The subroutine STAT(N,VALUE) is a general subroutine designed to compute ndard statistical information for the first N values stored in the array UE(400), which contains PSI values. The subroutine computes the following tistics using the following formulas:

Arithmetic Mean

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Second Moment About the Mean

$$m_2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1}$$

Standard Deviation

$$s_2 = \sqrt{m_2}$$

Coefficient of Variation

$$v = \frac{s_2}{\bar{x}}$$

Third Moment About the Mean

$$s_3 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^3}{n}$$

Fourth Moment About the Mean

$$s_4 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^4}{n}$$

Coefficient of Skewness

$$b_1 = \frac{m_3}{m_2^{1.5}}$$

Coefficient of Kurtosis

$$b_2 = \frac{m_4}{m_2^2}$$

As indicated by Hahn and Shapiro,[12] the above measures are useful for characterizing the shape of the frequency distribution of any set of observations. Because the first N values stored in the array VALUE(400) usually consist of the PSI values calculated by the subroutine PSI for a year of data, these statistics are helpful in describing the overall features of the distribution of the PSI values computed for the year. Examination of this subroutine will reveal that no special steps are taken to deal with missing values, because only the "nonmissing" PSI values have been stored in the array VALUE.

Subroutine HISTOG

The subroutine HISTOG(INSTR,N,VALUE,BASE,DELTA) partitions the N values contained in the array VALUE(N) into 100 intervals of equal size DELTA. The partitioning begins at the value specified by BASE and ends at the value specified by TOP = (100)(DELTA) + BASE. Thus, the range of the partitioning process is (100)(DELTA) units. Then the subroutine prints a histogram showing the results on the line printer.

This subroutine first tests each value contained in the array VALUE to see if it is zero; if so, it increments IZERO, which counts the total number of zero values. To compensate for FORTRAN decimal conversion error inherent in the IBM system, each number in the array VALUE is incremented by 0.000001. If the incremented number PVALUE is less than BASE, ILOW is incremented, which counts the number of values below the range. If the PVALUE is less than TOP, execution proceeds; if not, IEXCES is incremented, which counts the number of values above the range. If INSTR = 1, and PVALUE exceeds TOP, the (unincremented) value is stored in the array HIVAL so that it can be printed at the end of the histogram.

Sorting is carried out by the DO loop that ends at Statement #25. For each iteration of this loop, SDELTA is incremented by DELTA. Thus, for J = 1, SDELTA = DELTA, and TDELTA = SDELTA + BASE = DELTA + BASE. Then, the subroutine tests to see if PVALUE is less than (LT) TDELTA. If it is not, then PVALUE must still be greater than TDELTA, and execution continues in the loop, thereby incrementing SDELTA again. As soon as this condition is fulfilled; namely, that PVALUE is less than TDELTA, execution transfers out of the loop, because PVALUE must be within the following interval:

$$(\text{TDELTA}-\text{DELTA}) \leq \text{PVALUE} < \text{TDELTA}$$

For example, if the value lies in the second interval, then, for the first iteration (J = 1), PVALUE will not be less than TDELTA and the condition will not be fulfilled. For the second iteration (J = 2), PVALUE will be less than TDELTA = 2(DELTA) + BASE, and the condition will be fulfilled. Thus, JHIST(2) will be incremented, indicating that the value lies in the second interval. If the number of values outside of the range exceeds 100, then an error message is printed suggesting that DELTA be increased. Finally, the number of histogram points are summed by adding all of the elements in JHIST. When combined with the integer count IEXCES, the result will equal the total number of values contained

in JHIST, less those below the BASE. Notice that values less than the BASE are excluded from all histogram computations, such as the calculation of cumulative frequencies. (For INDEX.PLOT, this feature is of little importance, because the BASE is set to zero.) Although zero values are counted separately and the count is stored in IZERO, this count does not affect the histogram operation, and any zero value will be included in the first interval.

The abscissa is created and stored in the vector XI(100) by successively adding DELTA to the BASE. The individual frequencies are computed and stored in the vector PVAL(100), while the cumulative frequencies are stored in the vector CUMVAL(100). Finally, the line printer prints the abscissa, the number of values in each interval, the individual frequencies, a graph of the individual and cumulative frequencies, and the listing of cumulative frequencies for the full 100 intervals.

When the subroutine HISTOG is called from the MAIN Program, the BASE is set to zero, and the interval width automatically is set to 5.0 (BASE = 0.0 and DELTA = 5.0). Consequently, the range always is between 0 and 500, which is generally appropriate for plotting PSI values.

III. RUNNING THE PROGRAM

Input Data

Because the PSI is based on the U. S. National Ambient Air Quality Standards (NAAQS), INDEX.PLOT requires input data in a form consistent with the averaging times used in the NAAQS:

Pollutant	Averaging Time
CO	8-hr Average*
O_3	1-hr Average
NO_2	1-hr Average
SO_2	24-hr Average*
TSP	24-hr Average
TSP x SO_2	24-hr Average

For CO and SO_2, EPA recommends that the data be specified as "running" averages. For example, each 24-hour period has 24 8-hour CO running average values, one beginning at each hour of the day.

For the pollutants with running averages, the INDEX.PLOT program used the highest average value in any 24-hour period. That is, the highest 8-hour CO concentration of the 24 individual average values was used for the computer run given in Appendix B. The raw data are listed in Appendix C and come from air monitoring activities in Newark, New Jersey, in 1974. Because this format differs from the standard EPA Storage and Retrieval of Aerometric Data (SAROAD) format, EPA sponsored the development of specialized computer software for retrieving air quality data from SAROAD in this format. Users wishing additional information about this software or about INDEX.PLOT should contact Jon Clark, Project Officer, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. This software is documented in a report by Bennett.[13]

*Running average concentration.

The data files for INDEX.PLOT ordinarily are set up as specified in the comments contained in the main program. For the example given in the appendices, a title was used. This title specified the monitoring station code, the city, and the pollutant names and units. As indicated in the above discussion of the main program, a title will be read and printed only if the integer value "11" is specified in columns 1-2 of the record immediately preceding the title record. The title itself, consisting of any alphanumeric characters, is placed on columns 1-80. As many title lines as desired may be used, but each line must be preceded by a record containing "11."

The data then are read according to FORMAT Statement #100. In the present version of the program, each data record contains the date (columns 22-41), listed in the same order discussed above (month, day, year). The dates, which are merely read and then printed, can be omitted, since no computations are performed on them.

At the very end of the data file, a record must be inserted containing "99" in columns 1-2 to indicate that no more data are coming and that computation is ready to begin. Appendix C contains a listing of the raw data file used by the program given in Appendix A to generate the output shown in Appendix B, and the user should refer to this raw data listing in setting up his own data file.

Presentation of Data

The output of INDEX.PLOT consists of seven basic items, each produced by the subroutines described in the previous sections:

1. Title of the data set (if specified)
2. List of the input data (reformatted)
3. Count of the missing values, by pollutant
4. Graphical time series plot of PSI values on the line printer
5. PSI summary tables
6. Statistical results
7. PSI histogram and cumulative frequencies

The first three items are intended only as reference information for the data analyst, while the last four items can be used directly to create figures and visual displays of PSI values. Examples of plots based on the time series output can be found in the PSI computer evaluation conducted by Ott and Hunt[5] based on data from eight cities and in the book on indices by Ott.[6] Probably the most useful output of INDEX.PLOT is item #5, the PSI summary tables, which enables the data analyst to generate bar charts of the number (or percentage) of PSI values in each descriptor category. These can be listed for each pollutant or for PSI itself. One

approach is to display each of the PSI subindices on an adjacent bar. If the overall lengths of the bars are identical, with the lengths of shaded areas on each bar corresponding to the proportion of the time period within each descriptor category (i.e., proportion of days in the "good," "moderate," "unhealthful," ranges, etc.), the result is called a "PSI bar." PSI bars are recommended by the author[6] as a desirable technique for comparing ambient air quality in different cities or at different air monitoring stations.

Figures 1 and 2 show colored PSI bars calculated from the output runs of INDEX.PLOT which originally were used to prepare an article by Ott and Hunt.[9] These figures also appear in my recent book[6] on indices, which describes the advantages and possible applications of PSI bars in greater detail. In these two figures, PSI bars have been constructed for five United States cities with relatively complete data sets (Figure 1) and for three United States cities with data sets with many missing values (Figure 2). The colors were selected by Robert Flanagan of EPA's Office of Public Awareness to depict psychologically a gradual worsening of air quality. The goal was to communicate the message with a minimum effort and concentration on the part of the reader. Standard colors (e.g., blue, yellow, orange, and red) were found to be somewhat less effective for this application because they required the reader to "learn" the meaning of each color and, therefore, a "sense" of the severity of the air pollution problem in each city was not perceived automatically or intuitively. It is hoped that PSI users will consider the colors given in Figures 1 and 2 as a possible standard set of colors for reporting PSI descriptor categories to the public. (These colors were described to the printer as follows: "good," 30% PMS process blue; "moderate," 50% PMS process blue and 10% PMS 253 purple; "unhealthful," 50% PMS 253 purple; "very unhealthful," 100% PMS 253 purple.)

The statistical results generated by the program output can be used to summarize PSI values in concise, tabular form, and the histogram plot can be used directly to plot PSI on logarithmic probability paper, or on other types of probability paper. Figure 3, taken from the article by Ott and Hunt,[9] shows an example of a logarithmic probability plot of PSI values for five United States cities. Readers wishing additional examples of ways to display the PSI, and additional information on the index itself, are advised to consult the literature.[1-7,9-11]

Program Running Costs

This program was run on the IBM 370 computers that serve EPA through its contract with COMNET in Bethesda, Maryland. The program required 7.54 central processing unit seconds and cost $4.13 for the example contained in this report. It is expected that the cost of running INDEX.PLOT on data from most United States cities generally will be less than $5.00 per run.

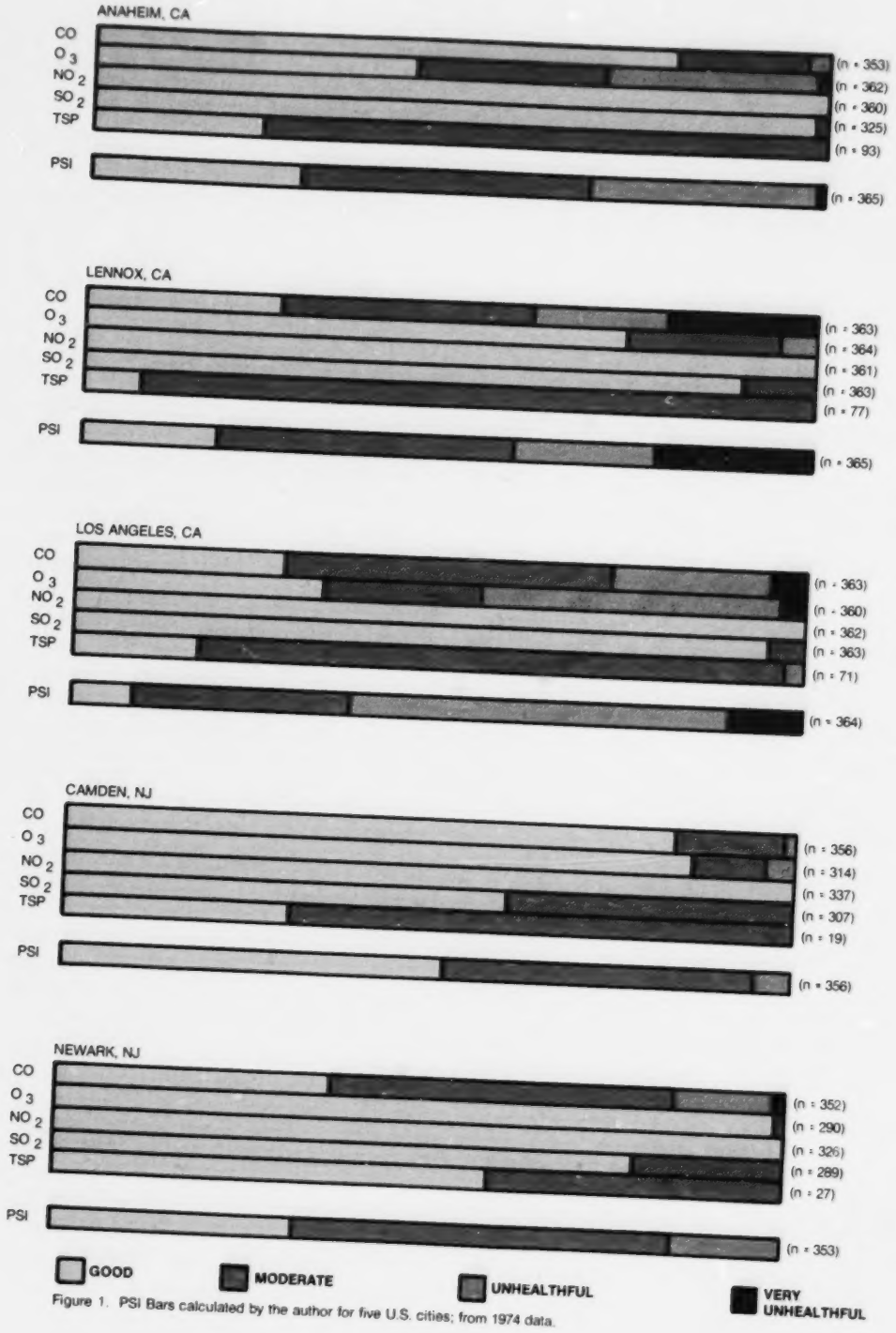

Figure 1. PSI Bars calculated by the author for five U.S. cities; from 1974 data.

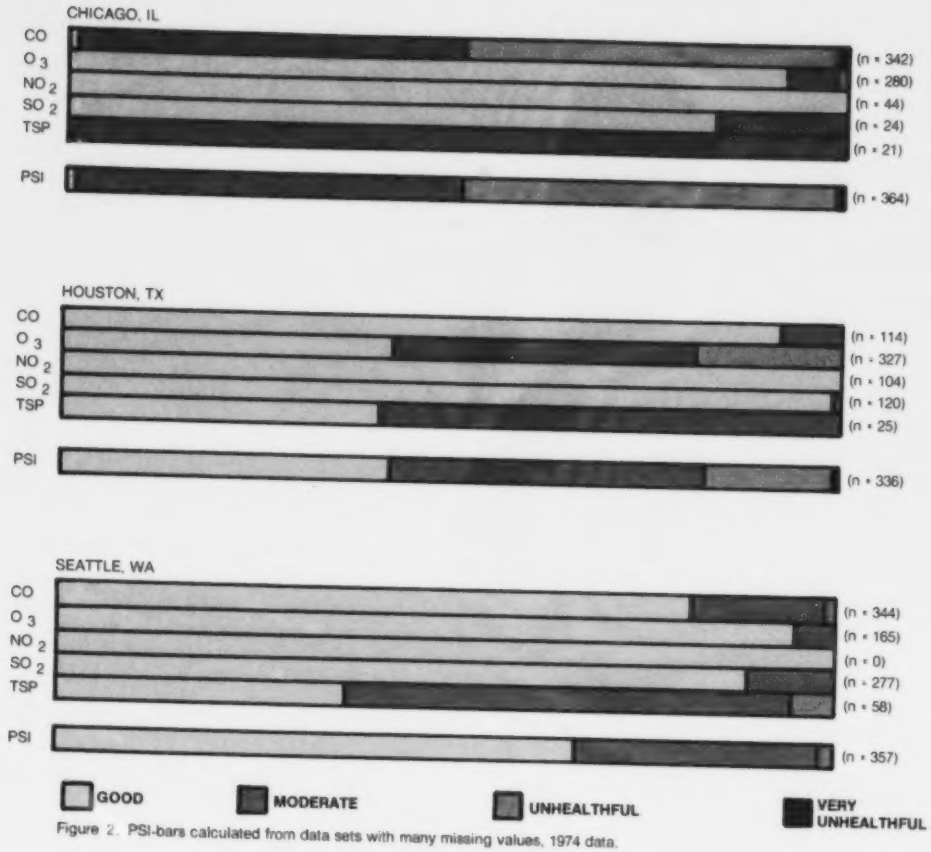

Figure 2. PSI-bars calculated from data sets with many missing values, 1974 data.

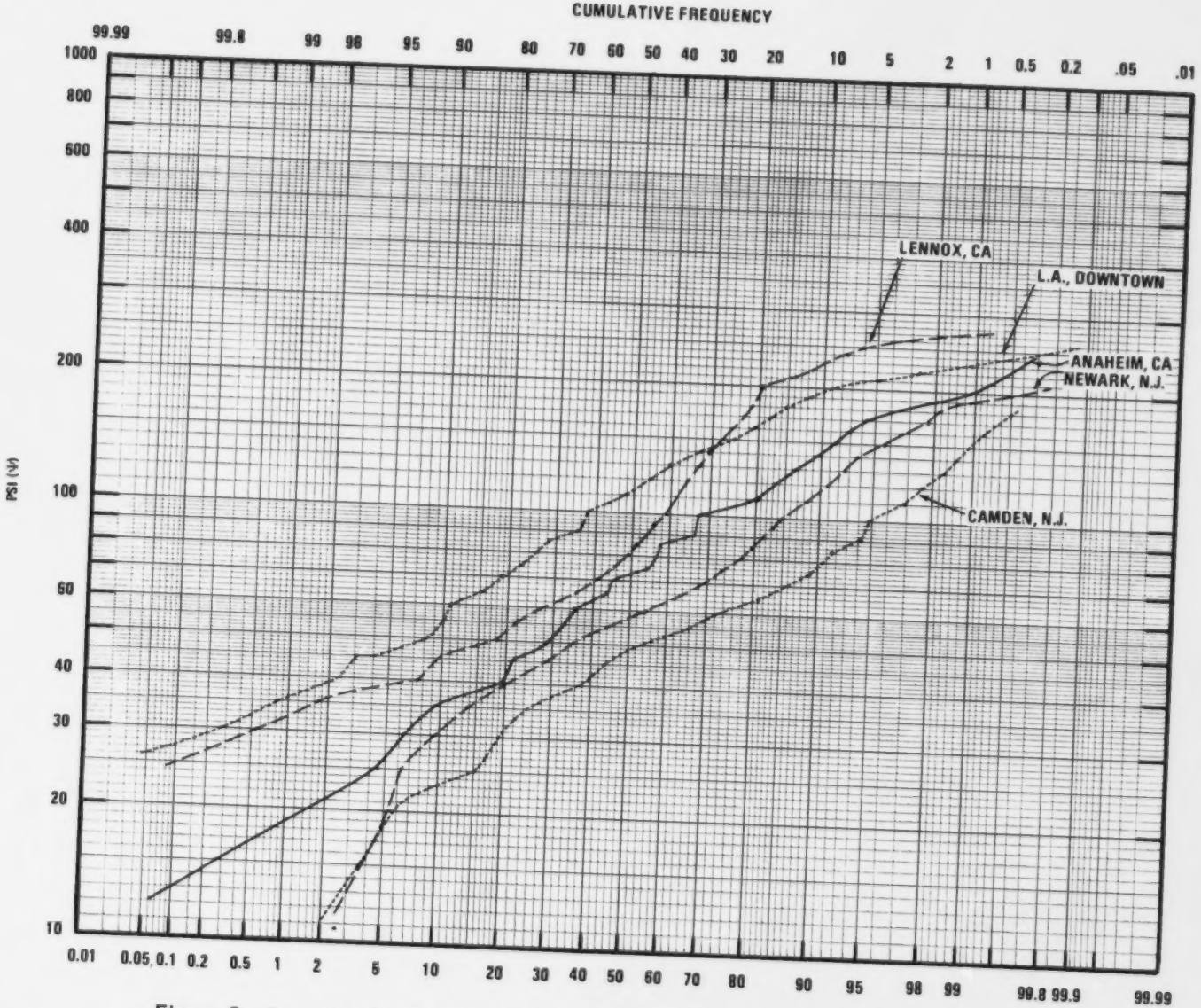

Figure 3. Logarithmic probability plots of PSI for five U.S. cities (Ott and Hunt[9]).

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Meeting of the Air Pollution Control Association, Toronto, Ontario, Canada, June 20-24, 1977.

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APPENDIX A

PROGRAM LISTING OF INDEX.PLOT

```
C   PROGRAM NAME = INSPLOT1 (COMPLETED MARCH 30, 1978)
C   PROGRAM IS WRITTEN IN FORTRAN IV AND RUNS ON THE OSI IBM 360/370
C       PROGRAMMER IS WAYNE R. OTT
C   U.S. ENVIRONMENTAL PROTECTION AGENCY
C   PROGRAM IS DESIGNED TO PLOT AND ANALYZE PSI AIR POLLUTION INDEX,
C       APPLYING IT TO REAL DATA
C   PROGRAM READS FIVE AIR POLLUTANTS PER RECORD (CARD IMAGE FORMAT)
C       POLLUTANTS = CO,O3,NO2,SO2,TSP WITH F7.2 FORMATS IN COL 11-60
C       SET Z TO THE CODE FOR MISSING VALUES
C       A "99" IN COL. 1-2 SHOULD APPEAR AT END OF DATA SET
C       INCLUDE DATA SET TITLES BY INSERTING THE 80-CHARACTER TITLE BEFORE
C       THE DATA, PRECEDED BY A LINE WITH "11" IN COL. 1-2
C
C
C    * * *  HOUSEKEEPING SECTION  * * *
C
      COMMON /A/LINE(100),IBLANK,MARKI,MARK1,MARK2
      COMMON /B/MARKC,MARKO,MARKN,MARKS,MARKT,MARKP
      COMMON /C/XI(100),JHIST(100),PVAL(100),CUMVAL(100)
      COMMON /D/HIVAL(100)
      DIMENSION STORE(400,6)
      DIMENSION VALUE(400)
      DIMENSION ID(400,6)
      DIMENSION IUNITS(5)
      DIMENSION MSUM(7,6),SUB(7),L(400),NC(7),P(7)
C
C  INITIALIZE VALUES
      J=1
      N=0
      DO 10 I=1,100
      LINE(I)=IBLANK
   10 CONTINUE
      DO 20 K=1,7
      DO 30 M=1,6
      MSUM(K,M)=0
   30 CONTINUE
   20 CONTINUE
C...SET Z TO DENOTE CODE FOR MISSING VALUES
      Z=999.99
C
C
C  * * *  INPUT SECTION  * * *
C
C...ID CONTAINS 6 DIGITS OF DATE
C...STORE CONTAINS 6 VARIABLES: CO,O3,NO2,SO2,TSP,SO2 X TSP
    1 CONTINUE
      READ(5,100) ITEST,(ID(J,K),K=1,6),(STORE(J,K),K=1,5)
  100 FORMAT(I2,13X,6I1,5(1X,F7.2))
```

```
      IF(ITEST.EQ.11)   CALL TITLE
      IF(ITEST.EQ.11)   GO TO 1
      IF(ITEST.EQ.99.OR.J.GT.400)   GO TO 900
C...COMPUTE SO2 X TSP PRODUCT
      IF(STORE(J,4).EQ.Z.OR.STORE(J,5).EQ.Z)   STORE(J,6)=Z
      IF(STORE(J,4).NE.Z.AND.STORE(J,5).NE.Z)
     1   STORE(J,6)=STORE(J,4)*STORE(J,5)
C...PRINT DATA
      CALL PRINT(J,ID,STORE)
C...INCREMENT DATA COUNTER
      J=J+1
      GO TO 1
  900 CONTINUE
C...NSUM IS TOTAL NO. OF DAYS
      NSUM=J-1
C...SET UNITS CODES MANNUALLY IF THEY ARE NOT READ IN
C......SET CO UNITS: MG/M3 IS 5; PPM IS 7
      IUNITS(1)=5
C......SET O3 UNITS: UG/M3 IS 1; PPM IS 7
      IUNITS(2)=7
C......SET NO2 UNITS: UG/M3 IS 1; PPM IS 7
      IUNITS(3)=7
C......SET SO2 UNITS: UG/M3 IS 1; PPM IS 7
      IUNITS(4)=1
C......SET TSP UNITS: UG/M3 IS 1
      IUNITS(5)=1
C
C
C  * * *  COMPUTATION SECTION  * * *
C
C...CARRY OUT INVENTORY OF MISSING VALUES
      CALL CHECK(NSUM,STORE,Z)
C...COMPUTE AND PRINT PSI INDEX
      WRITE(6,210)
      WRITE(6,212)
      WRITE(6,215)
      DO 40 J=1,NSUM
      CALL PSI(J,N,STORE,VALUE,Z,IUNITS,MSUM,SUB,L)
   40 CONTINUE
      WRITE(6,215)
C...PRINT SUMMARY OF PSI INDEX AND ITS SUBINDICES
      CALL TOTAL(MSUM,L,NSUM,NC,P)
C...CARRY OUT STATISTICAL ANALYSES
      CALL STAT(N,VALUE)
C...GENERATE FREQUENCY DISTRIBUTION
      CALL HISTOG(1,N,VALUE,0.0,5.0)
C
C
C
  210 FORMAT(1H1,20X,'*  *  *  *  *  T H E  P O L L U T A N T  S T A N D
     1 A R D S  I N D E X  (P S I)  *  *  *  *  *')
  212 FORMAT(//,1X,'DAY',1X,'INDEX',2X,'0',4X,'25',3X,'50',3X,'75',2X,
     1'100',2X,'125',2X,'150',2X,'175',2X,'200',2X,'225',2X,'250',2X
     2'275',2X,'300',2X,'325',2X,'350',2X,'375',2X,'400',2X,'425',2X
     3'450',2X,'475',2X,'500',3X,'DESCRIPTORS')
  215 FORMAT(12X,'+----+----+----+----+----+----+----+----+----+----+----+---
     1-+----+----+----+----+----+----+----+----+----+----+----+----+----+')
      END
```

```
      BLOCK DATA
      COMMON /A/LINE(100),IBLANK,MARKI,MARK1,MARK2
      DATA IBLANK/'    '/,MARKI/'I   '/,MARK1/'*   '/,MARK2/'+   '/
      COMMON /B/MARKC,MARKO,MARKN,MARKS,MARKT,MARKP
      DATA MARKC/'C   '/,MARKO/'O   '/,MARKN/'N   '/,
     1MARKS/'S   '/,MARKT/'T   '/,MARKP/'P   '/
      END
```

```
      SUBROUTINE TITLE
C SUBROUTINE TO PRINT IDENTIFICATION TITLE
      COMMON /A/LINE(100),IBLANK,MARKI,MARK1,MARK2
      READ(5,101)  (LINE(I),I=1,80)
      WRITE(6,201)  (LINE(I),I=1,80)
C...CLEAR ARRAY
      DO 10 I=1,80
      LINE(I)=IBLANK
   10 CONTINUE
  101 FORMAT(80A1)
  201 FORMAT(1H ,////////,1X,'TITLE OF DATA SET: ',80A1)
      RETURN
      END
```

```
      SUBROUTINE PRINT(J,ID,STORE)
C SUBROUTINE TO PRINT INPUT DATA
      DIMENSION ID(400,6),STORE(400,6)
      IF(J.EQ.1)   WRITE(6,201)
      IF(J.GT.400)   GO TO 20
      WRITE(6,205) J,(ID(J,K),K=1,6),(STORE(J,K),K=1,6)
      GO TO 30
   20 WRITE(6,210)
  201 FORMAT(1H1,16X,'DATE',18X,'CO',8X,'O3',7X,'NO2',7X,'SO2',7X,
     1'TSP',9X,'TSPXSO2')
  205 FORMAT(1H ,2X,I5,8X,6I1,10X,5F10.2,F15.2)
  210 FORMAT(1H0,'ERROR: INPUT DATA SET CONTAINS MORE THAN 400 VALUES')
   30 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE CHECK(NSUM,STORE,Z)
C SUBROUTINE TO INVENTORY MISSING VALUES
      DIMENSION STORE(400,6)
      WRITE(6,201) NSUM
      MCO=0
      MO3=0
      MNO2=0
      MSO2=0
      MTSP=0
      DO 50 I=1,NSUM
C...COUNT CO MISSING VALUES
      IF(STORE(I,1).NE.Z)   GO TO 10
      MCO=MCO+1
C...COUNT O3 MISSING VALUES
   10 IF(STORE(I,2).NE.Z)   GO TO 20
      MO3=MO3+1
C...COUNT NO2 MISSING VALUES
   20 IF(STORE(I,3).NE.Z)   GO TO 30
      MNO2=MNO2+1
C...COUNT SO2 MISSING VALUES
   30 IF(STORE(I,4).NE.Z)   GO TO 40
      MSO2=MSO2+1
C...COUNT TSP MISSING VALUES
   40 IF(STORE(I,5).NE.Z)   GO TO 50
      MTSP=MTSP+1
   50 CONTINUE
      WRITE(6,202)  MCO
      WRITE(6,203)  MO3
      WRITE(6,204)  MNO2
      WRITE(6,205)  MSO2
      WRITE(6,206)  MTSP
  201 FORMAT(1H ,/////,2X,'OF',I4,' RECORDS, THE FOLLOWING MISSING VALUE
     1S WERE OBSERVED:',///)
  202 FORMAT(1H0,10X,' CO MISSING VALUES:',I4)
  203 FORMAT(1H0,10X,' O3 MISSING VALUES:',I4)
  204 FORMAT(1H0,10X,'NO2 MISSING VALUES:',I4)
  205 FORMAT(1H0,10X,'SO2 MISSING VALUES:',I4)
  206 FORMAT(1H0,10X,'TSP MISSING VALUES:',I4)
      RETURN
      END
```

```
      SUBROUTINE PSI(J,N,STORE,VALUE,Z,IUNITS,MSUM,SUB,L)
C SUBROUTINE TO CALCULATE AND PRINT THE POLLUTANT STANDARDS INDEX (PSI)
      DIMENSION STORE(400,6),IUNITS(5),SUB(7),MSUM(7,6),L(400)
      DIMENSION VALUE(400)
      COMMON /A/LINE(100),IBLANK,MARKI,MARK1,MARK2
      COMMON /B/MARKC,MARKO,MARKN,MARKS,MARKT,MARKP
C...CLEAR VARIABLES
      SUBCO=0.0
      SUBO3=0.0
      SUBNO2=0.0
      SUBSO2=0.0
      SUBTSP=0.0
      S=0.0
C...CALCULATE SUBINDEX FOR CO
      T=STORE(J,1)
      IF(T.EQ.Z)   GO TO 13
      IF(IUNITS(1).EQ.5)   GO TO 11
      IF(IUNITS(1).EQ.7)   GO TO 12
      GO TO 13
C......CO IN MG/M3;
   11 IF(T.GE.0.0.AND.T.LT.10.0)    SUBCO=10.0*T
      IF(T.GE.10.0.AND.T.LT.17.0)   SUBCO=14.285714*(T-10.0) + 100.0
      IF(T.GE.17.0.AND.T.LT.34.0)   SUBCO=5.8823529*(T-17.0) + 200.0
      IF(T.GE.34.0.AND.T.LT.46.0)   SUBCO=8.3333333*(T-34.0) + 300.0
      IF(T.GE.46.0)                 SUBCO=8.695652*(T-46.0) + 400.0
      GO TO 13
C......CO IN PPM;
   12 IF(T.GE.0.0.AND.T.LT.9.0)     SUBCO=11.111111*T
      IF(T.GE.9.0.AND.T.LT.15.0)    SUBCO=16.666667*(T-9.0) + 100.0
      IF(T.GE.15.0.AND.T.LT.30.0)   SUBCO=6.6666667*(T-15.0) + 200.0
      IF(T.GE.30.0)                 SUBCO=10.0*(T-30.0) + 300.0
      GO TO 13
C...CALCULATE SUBINDEX FOR O3
   13 T=STORE(J,2)
      IF(T.EQ.Z)   GO TO 23
      IF(IUNITS(2).EQ.1)   GO TO 21
      IF(IUNITS(2).EQ.7)   GO TO 22
      GO TO 23
C......O3 IN UG/M3;
   21 IF(T.GE.0.0.AND.T.LT.160.0)     SUBO3=0.625*T
      IF(T.GE.160.0.AND.T.LT.400.0)   SUBO3=.416666667*(T-160.0) + 100.0
      IF(T.GE.400.0.AND.T.LT.800.0)   SUBO3=0.25*(T-400.) + 200.0
      IF(T.GE.800.0)                  SUBO3=0.5*(T-800.0) + 300.0
      GO TO 23
C......O3 IN PPM
   22 IF(T.GE.0.0.AND.T.LT.0.08)    SUBO3=1250.0*T
      IF(T.GE.0.08.AND.T.LT.0.2)    SUBO3=833.33333*(T-0.08) + 100.0
      IF(T.GE.0.2.AND.T.LT.0.4)     SUBO3=500.0*(T-0.2) + 200.0
      IF(T.GE.0.4)                  SUBO3=1000.0*(T-0.4) + 300.0
      GO TO 23
C...CALCULATE SUBINDEX FOR NO2
   23 T=STORE(J,3)
      IF(T.EQ.Z)   GO TO 33
      IF(IUNITS(3).EQ.1)   GO TO 31
      IF(IUNITS(3).EQ.7)   GO TO 32
      GO TO 33
```

```
C......NO2 IN MG/M3
   31 IF(T.GE.1130.0.AND.T.LT.2260.0) SUBNO2=.088495575*(T-1130.) + 200.
      IF(T.GE.2260.0.AND.T.LT.3000.0) SUBNO2=.135135135*(T-2260.) + 300.
      IF(T.GE.3000.0)                 SUBNO2=.133333333*(T-3000.) + 400.
      GO TO 33
C......NO2 IN PPM
   32 IF(T.GE.0.6.AND.T.LT.1.2)    SUBNO2=166.666667*(T-0.6) + 200.
      IF(T.GE.1.2)                 SUBNO2=250.0*(T-1.2) + 300.
      GO TO 33
C...CALCULATE SUBINDEX FOR SO2
   33 T=STORE(J,4)
      IF(T.EQ.Z)    GO TO 43
      IF(IUNITS(4).EQ.1)    GO TO 41
      IF(IUNITS(4).EQ.7)    GO TO 42
      GO TO 43
   41 IF(T.GE.0.0.AND.T.LT.80.0)          SUBSO2=0.625000*T
      IF(T.GE.80.0.AND.T.LT.365.0)        SUBSO2=.17543860*(T-80.0) + 50.
      IF(T.GE.365.0.AND.T.LT.800.0)       SUBSO2=0.229885*(T-365.0) + 100.
      IF(T.GE.800.0.AND.T.LT.1600.0)      SUBSO2=0.125*(T-800.0) + 200.0
      IF(T.GE.1600.0.AND.T.LT.2100.0)     SUBSO2=0.2*(T-1600.0) + 300.0
      IF(T.GE.2100.0)                     SUBSO2=0.192308*(T-2100.0) + 400.
      GO TO 43
C......SO2 IN PPM
   42 IF(T.GE.0.0.AND.T.LT.0.03)    SUBSO2=1666.66667*T
      IF(T.GE.0.03.AND.T.LT.0.14)   SUBSO2=454.545456*(T-0.03) + 50.0
      IF(T.GE.0.14.AND.T.LT.0.3)    SUBSO2=625.0*(T-0.14) + 100.
      IF(T.GE.0.3.AND.T.LT.0.6)     SUBSO2=333.333333*(T-0.3) + 200.0
      IF(T.GE.0.6)                  SUBSO2=500.0*(T-0.6) + 300.0
      GO TO 43
C......CALCULATE SUBINDEX FOR TSP (UNITS ALWAYS ARE IN UG/M3)
   43 T=STORE(J,5)
      IF(T.EQ.Z)    GO TO 53
      IF(T.GE.0.0.AND.T.LT.75.0)          SUBTSP=.666666667*T
      IF(T.GE.75.0.AND.T.LT.260.0)        SUBTSP=0.27027027*(T-75.) + 50.
      IF(T.GE.260.0.AND.T.LT.375.0)       SUBTSP=.869565217*(T-260.0) + 100.
      IF(T.GE.375.0.AND.T.LT.875.0)       SUBTSP=0.4*(T-375.0) + 200.0
      IF(T.GE.875.0)                      SUBTSP=0.8*(T-875.0) + 400.0
      GO TO 53
C...CALCULATE SUBINDEX FOR SO2 X TSP
   53 T=STORE(J,6)
      IF(T.EQ.Z)    GO TO 63
      IF(IUNITS(4).EQ.1)    GO TO 61
      IF(IUNITS(4).EQ.7)    GO TO 62
C......TSP IN UG/M3 AND SO2 IN UG/M3:
   61 IF(T.GE.65000.0.AND.T.LT.261000.0)  S=.000510204*(T-65000.0) + 200.
      IF(T.GE.261000.0.AND.T.LT.393000.0) S=.000757576*(T-261000.0)+300.
      IF(T.GE.393000.0)      S=0.0010309278*(T-393000.0) + 400
      GO TO 63
C......TSP IN UG/M3 AND SO2 IN PPM:
   62 IF(T.GE.24.82.AND.T.LT.99.66)   S=1.3361839*(T-99.66) + 200.
      IF(T.GE.99.66.AND.T.LT.150.1)   S=1.9825535*(T-99.66) + 300.
      IF(T.GE.150.1)                  S=2.702703*(T-150.1) + 400.
   63 CONTINUE
```

```
C ANALYZE RESULTS
C...FILL SUBINDEX STORAGE ARRAY
      SUB(1)=SUBCO
      SUB(2)=SUBO3
      SUB(3)=SUBNO2
      SUB(4)=SUBSO2
      SUB(5)=SUBTSP
      SUB(6)=S
      SUB(7)=AMAX1(SUBCO,SUBO3,SUBNO2,SUBSO2,SUBTSP,S)
C...DETERMINE IF ALL SUBINDICES ARE MISSING
      IF(STORE(J,1).EQ.Z.AND.STORE(J,2).EQ.Z.AND.STORE(J,3).EQ.Z.
     1AND.STORE(J,4).EQ.Z.AND.STORE(J,5).EQ.Z)   GO TO 15
C...DETERMINE WHICH POLLUTANT IS MAXIMUM
      T=SUB(7)
      DO 65 I=1,6
      IF(SUB(I).EQ.T)   L(J)=I
   65 CONTINUE
C...STORE MAXIMUM SUBINDEX
      N=N+1
      VALUE(N)=T
C...INSERT MARKERS
      DO 70 I=20,100,20
      LINE(I)=MARKI
   70 CONTINUE
C...SORT SUBINDICES INTO INTERVALS AND PERFORM SUMMATION BY POLLUTANT
      DO 75 I=1,7
C...SKIP SUMMATION IF THE POLLUTANT IS MISSING
      IF(STORE(J,I).EQ.Z)   GO TO 77
      T=SUB(I)
      IF(T.LE.50.0)                          M=1
      IF(T.GT.50.0.AND.T.LE.100.0)   M=2
      IF(T.GT.100.0.AND.T.LT.200.0)  M=3
      IF(T.GE.200.0.AND.T.LT.300.0)  M=4
      IF(T.GE.300.0)                         M=5
      MSUM(I,M)=MSUM(I,M)+1
   77 CONTINUE
      IF(I.EQ.7)   MEM=M
C...INSERT POLLUTANT CODE INTO LINE VECTOR FOR MAX & SUBINDICES > 100
C...SCALE VALUE
      K=IFIX(T/5.0)
      IF(K.LE.0)   K=1
      IF(K.GE.100)   K=100
C...INSERT POLLUTANT CODE FOR ALL SUBINDICES > 100, EXCEPT THE MAXIMUM
      IF(T.LT.100.0)   GO TO 78
C...INSERT POLLUTANT CODE IN LINE VECTOR
      IF(I.EQ.1)   LINE(K)=MARKC
      IF(I.EQ.2)   LINE(K)=MARKO
      IF(I.EQ.3)   LINE(K)=MARKN
      IF(I.EQ.4)   LINE(K)=MARKS
      IF(I.EQ.5)   LINE(K)=MARKT
      IF(I.EQ.6)   LINE(K)=MARKP
   78 CONTINUE
```

```
C...INSERT POLLUTANT CODE FOR MAXIMUM SUBINDEX
      IF(I.NE.7)   GO TO 75
      IF(L(J).EQ.1)   LINE(K)=MARKC
      IF(L(J).EQ.2)   LINE(K)=MARKO
      IF(L(J).EQ.3)   LINE(K)=MARKN
      IF(L(J).EQ.4)   LINE(K)=MARKS
      IF(L(J).EQ.5)   LINE(K)=MARKT
      IF(L(J).EQ.6)   LINE(K)=MARKP
   75 CONTINUE
C...PRINT ONE LINE OF GRAPH OF PSI INDEX
      GO TO (81,82,83,84,85), MEM
   81 WRITE(6,221) J,T,LINE
      GO TO 30
   82 WRITE(6,222) J,T,LINE
      GO TO 30
   83 WRITE(6,223) J,T,LINE
      GO TO 30
   84 WRITE(6,224) J,T,LINE
      GO TO 30
   85 WRITE(6,225) J,T,LINE
   30 CONTINUE
C.....CLEAR LINE VECTOR
      DO 100 I=1,100
      LINE(I)=IBLANK
  100 CONTINUE
      GO TO 20
   15 CONTINUE
C...MISSING VALUE ENCOUNTERED
      T=0.0
      L(J)=7
      WRITE(6,220) J,T
   20 CONTINUE
  220 FORMAT(1X,I3,F7.0,1X,'I',5(19X,'I'))
  221 FORMAT(1X,I3,F7.0,1X,'I',100A1,7X,'GOOD')
  222 FORMAT(1X,I3,F7.0,1X,'I',100A1,5X,'MODERATE')
  223 FORMAT(1X,I3,F7.0,1X,'I',100A1,4X,'UNHEALTHFUL')
  224 FORMAT(1X,I3,F7.0,1X,'I',100A1,2X,'V. UNHEALTHFUL')
  225 FORMAT(1X,I3,F7.0,1X,'I',100A1,4X,'HAZARDOUS')
      RETURN
      END
```

```
      SUBROUTINE TOTAL(MSUM,L,NSUM,P,NC)
      DIMENSION MSUM(7,6),L(400),NC(7),P(7)
C SUBROUTINE TO PRINT DISTRIBUTION OF WORDS BY SUBINDICES
      WRITE(6,210)
      WRITE(6,215)
      WRITE(6,220)
C...COMPUTE SUMS OF SUBINDICES
      DO 100 I=1,7
      DO 110 M=1,5
      MSUM(I,6)=MSUM(I,6)+MSUM(I,M)
  110 CONTINUE
  100 CONTINUE
C...PRINT DISTRIBUTION OF WORDS FOR SUBINDICES
      WRITE(6,231)   (MSUM(1,M),M=1,6)
      WRITE(6,232)   (MSUM(2,M),M=1,6)
      WRITE(6,233)   (MSUM(3,M),M=1,6)
      WRITE(6,234)   (MSUM(4,M),M=1,6)
      WRITE(6,235)   (MSUM(5,M),M=1,6)
      WRITE(6,236)   (MSUM(6,M),M=1,6)
      WRITE(6,220)
C...PRINT DISTRIBUTION OF WORDS FOR MAIN INDEX
      WRITE(6,237)   (MSUM(7,M),M=1,6)
C...PRINT PERCENTAGE DISTRIBUTION OF DESCRIPTOR WORDS BY SUBINDICES
      WRITE(6,240)
      WRITE(6,215)
      WRITE(6,220)
      DO 115 I=1,7
      DO 116 M=1,6
      P(M)=FLOAT(MSUM(I,M))*100.0/FLOAT(MSUM(I,6))
  116 CONTINUE
      IF(I.EQ.1)   WRITE(6,242)   (P(M),M=1,6)
      IF(I.EQ.2)   WRITE(6,243)   (P(M),M=1,6)
      IF(I.EQ.3)   WRITE(6,244)   (P(M),M=1,6)
      IF(I.EQ.4)   WRITE(6,245)   (P(M),M=1,6)
      IF(I.EQ.5)   WRITE(6,246)   (P(M),M=1,6)
      IF(I.EQ.6)   WRITE(6,247)   (P(M),M=1,6)
      IF(I.EQ.7)   WRITE(6,220)
      IF(I.EQ.7)   WRITE(6,248)   (P(M),M=1,6)
  115 CONTINUE
C...PRINT NUMBER OF OCCURRENCES OF VARIABLES
C...CLEAR COUNTING ARRAY
      DO 120 I=1,7
      NC(I)=0
  120 CONTINUE
C...PERFORM COUNT
      DO 122 I=1,NSUM
      IVAL=L(I)
      NC(IVAL)=NC(IVAL)+1
  122 CONTINUE
C...COMPUTE SUM--MISSING VALUES, IN NC(7), ARE NOT INCLUDED
      NTOT=0
      DO 124 I=1,6
      NTOT=NTOT+NC(I)
  124 CONTINUE
C...COMPUTE PERCENTAGE
      DO 126 I=1,6
      P(I)=FLOAT(NC(I))*100.0/FLOAT(NTOT)
  126 CONTINUE
```

```
C...COMPUTE SUM OF PERCENTAGES
      PTOT=0.0
      DO 128 I=1,6
      PTOT=PTOT+P(I)
  128 CONTINUE
C...PRINT SUMMARY OF CRITICAL POLLUTANTS
      WRITE(6,249)
      WRITE(6,250)
      WRITE(6,260)
      WRITE(6,251) NC(1),P(1)
      WRITE(6,252) NC(2),P(2)
      WRITE(6,253) NC(3),P(3)
      WRITE(6,254) NC(4),P(4)
      WRITE(6,255) NC(5),P(5)
      WRITE(6,256) NC(6),P(6)
      WRITE(6,260)
      WRITE(6,258) NTOT,PTOT
      WRITE(6,257) NC(7)
  210 FORMAT(1H1,2X,'SUMMARY OF RESULTS BY SUBINDEX AND BY DESCRIPTOR:')
  215 FORMAT(//,17X,'GOOD',8X,'MODERATE',5X,'UNHEALTHFUL',
     14X,'V. UNHEALTHFUL',3X,'HAZARDOUS',11X,'TOTAL')
  220 FORMAT(1H ,10X,'-------------------------
     1-------------------------------------------------------
  231 FORMAT(1H ,8X,'CO:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  232 FORMAT(1H ,8X,'O3:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  233 FORMAT(1H ,7X,'NO2:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  234 FORMAT(1H ,7X,'SO2:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  235 FORMAT(1H ,7X,'TSP:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  236 FORMAT(1H ,3X,'TSPXSO2:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3)
  237 FORMAT(1H0/,8X,'PSI:',5X,I3,2(11X,I3),3X,2(11X,I3),16X,I3,4X)
  240 FORMAT(//,6X,'RESULTS EXPRESSED AS A PERCENTAGE:',/)
  242 FORMAT(1H ,8X,'CO:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  243 FORMAT(1H ,8X,'O3:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  244 FORMAT(1H ,7X,'NO2:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  245 FORMAT(1H ,7X,'SO2:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  246 FORMAT(1H ,7X,'TSP:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  247 FORMAT(1H ,3X,'TSPXSO2:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1
     1)
  248 FORMAT(1H0/,8X,'PSI:',4X,F5.1,2(9X,F5.1),3X,2(9X,F5.1),14X,F5.1)
  249 FORMAT(1H0////,2X,'SUMMARY OF CRITICAL POLLUTANTS (POLLUTANTS FOR
     1WHICH SUBINDEX WAS MAXIMUM:)',//)
  250 FORMAT(1H ,8X,'POLLUTANT',4X,'NO. OF VALUES',4X,'PERCENT')
  251 FORMAT(1H ,11X,'CO',12X,I4,10X,F5.1)
  252 FORMAT(1H ,11X,'O3',12X,I4,10X,F5.1)
  253 FORMAT(1H ,11X,'NO2',11X,I4,10X,F5.1)
  254 FORMAT(1H ,11X,'SO2',11X,I4,10X,F5.1)
  255 FORMAT(1H ,11X,'TSP',11X,I4,10X,F5.1)
  256 FORMAT(1H ,9X,'TSPXSO2',9X,I4,10X,F5.1)
  257 FORMAT(1H0/,9X,'MISSING',10X,I4)
  258 FORMAT(1H0,10X,'TOTAL',10X,I4,9X,F6.1)
  260 FORMAT(1H ,7X,'----------  ---------------  ---------')
      RETURN
      END
```

```
      SUBROUTINE STAT(N,VALUE)
C SUBROUTINE TO COMPUTE STATISTICAL MOMENTS
      DIMENSION VALUE(400)
      IF (N.EQ.1)   GO TO 50
      WRITE(6,198)
C...COMPUTE MEAN
      T=FLOAT(N)
      SUM=0.0
      DO 10 I=1,N
      SUM=SUM+VALUE(I)
   10 CONTINUE
      AVE=SUM/T
      WRITE(6,199)
      WRITE(6,200) N
      WRITE(6,199)
      WRITE(6,210) AVE
      WRITE(6,199)
C...COMPUTE OTHER MOMENTS
      SUM2=0.0
      SUM3=0.0
      SUM4=0.0
      DO 20 I=1,N
      D=VALUE(I)-AVE
      Z2=D*D
      Z3=D*Z2
      Z4=D*Z3
      SUM2=SUM2+Z2
      SUM3=SUM3+Z3
      SUM4=SUM4+Z4
   20 CONTINUE
C...COMPUTE VARIANCE,STANDARD DEVIATION,AND COEFFICIENT OF VARIATION
      S2=SUM2/(T-1.0)
      STD=SQRT(S2)
      COF=STD/AVE
      WRITE(6,220) S2,STD
      WRITE(6,199)
      WRITE(6,225) COF
      WRITE(6,199)
C...COMPUTE COEFFICIENT OF SKEWNESS
      IF(S2.EQ.0.0)   GO TO 50
      S3=SUM3/T
      SKEW=S3/(S2**1.5)
      WRITE(6,230) S3,SKEW
      WRITE(6,199)
C...COMPUTE COEFFICIENT OF KURTOSIS
      S4=SUM4/T
      BETA2=S4/(S2*S2)
      WRITE(6,240) S4,BETA2
      WRITE(6,199)
C...FIND LOWEST AND HIGHEST VALUES
      VMAX=-99999999999.0
      VMIN=99999999999.0
      DO 30 I=1,N
      IF(VALUE(I).LT.VMIN)   VMIN=VALUE(I)
      IF(VALUE(I).GT.VMAX)   VMAX=VALUE(I)
   30 CONTINUE
```

```
      WRITE(6,245) VMIN
      WRITE(6,199)
      WRITE(6,246) VMAX
      WRITE(6,199)
      GO TO 60
   50 CONTINUE
      WRITE(6,250)
  250 FORMAT(1H ,5X,'NO ADDITIONAL STATISTICS POSSIBLE')
   60 CONTINUE
  198 FORMAT(1H1)
  199 FORMAT(1H0)
  200 FORMAT(1H0,5X,'N =',I8)
  210 FORMAT(1H0,5X,'MEAN =',F18.8)
  220 FORMAT(1H0,5X,'2ND MOMENT (VAR.) =',F22.10,12X,'STANDARD DEV. =',
     1F20.9)
  225 FORMAT(1H0,10X,'COEFFICIENT OF VARIATION =',F15.8)
  230 FORMAT(1H0,5X,'3RD MOMENT =',F20.9,9X,'COEF. OF SKEWNESS =',F15.8)
  240 FORMAT(1H0,5X,'4TH MOMENT =',F20.9,9X,'COEF. OF KURTOSIS =',F15.8)
  245 FORMAT(1H0,5X,'LOWEST VALUE =',F18.8)
  246 FORMAT(1H0,5X,'HIGHEST VALUE =',F18.9)
      RETURN
      END
```

```
      SUBROUTINE HISTOG(INSTR,N,VALUE,BASE,DELTA)
C THIS SUBROUTINE SORTS EACH OF N VALUES INTO INTERVALS OF SIZE DELTA
C IF INSTR=1, THE VALUES ABOVE THE RANGE ARE LISTED
C...XI CONTAINS THE HISTOGRAM ABSCISSA
C...PVAL CONTAINS THE INDIVIDUAL FREQUENCIES
C...CUMVAL CONTAINS THE CUMULATIVE FREQUENCIES
C...ILOW IS THE NUMBER OF VALUES BELOW THE RANGE
C...IZERO IS THE NUMBER OF ZERO VALUES
C...IEXCES IS THE NUMBER OF VALUES ABOVE THE RANGE
C...HIVAL CONTAINS THE INDIVIDUAL VALUES ABOVE THE RANGE
      DIMENSION VALUE(400)
      COMMON /A/LINE(100),IBLANK,MARKI,MARK1,MARK2
      COMMON /C/XI(100),JHIST(100),PVAL(100),CUMVAL(100)
      COMMON /D/HIVAL(100)
C CLEAR ARRAYS
      DO 1 I=1,100
      JHIST(I)=0
      PVAL(I)=0.0
      XI(I)=0.0
      CUMVAL(I)=0.0
    1 CONTINUE
C...CLEAR VALUES
      ILOW=0
      IZERO=0
      IEXCES=0
C...SET TOP OF RANGE
      TOP=100.*DELTA + BASE
```

```
C BEGIN SORTING ROUTINE
      DO 10 I=1,N
C...DETERMINE IF POINT IS A ZERO VALUE
      IF (VALUE(I).EQ.0.0)  IZERO=IZERO+1
C...MODIFY VALUE TO ADJUST FOR MACHINE DECIMAL CONVERSION ERROR
      PVALUE=VALUE(I) + 0.000001
C...DETERMINE IF POINT IS BELOW RANGE
      IF(PVALUE.GE.BASE)   GO TO 15
      ILOW=ILOW+1
      GO TO 10
   15 CONTINUE
C...DETERMINE IF POINT IS ABOVE RANGE
      IF(PVALUE.LT.TOP)    GO TO 20
      IEXCES=IEXCES+1
      IF(IEXCES.GT.1000)  GO TO 28
      IF(INSTR.EQ.1)    HIVAL(IEXCES)=VALUE(I)
      GO TO 10
   20 CONTINUE
C...POINT IS WITHIN RANGE; CARRY OUT SORTING
      SDELTA=0.0
      DO 25 J=1,100
      SDELTA=DELTA+SDELTA
      TDELTA=SDELTA+BASE
      IF(PVALUE.LT.TDELTA)    GO TO 27
   25 CONTINUE
   27 CONTINUE
C PVALUE IS GE THAN VALUE(I); THEREFORE INTERVAL HAS BEEN FOUND;
      JHIST(J)=JHIST(J)+1
      GO TO 10
   28 CONTINUE
C ERROR; NUMBER OF POINTS ABOVE RANGE EXCEEDS ARRAY SIZE
      IF(IEXCES.EQ.1001)    WRITE(6,2099)
 2099 FORMAT(1H1,2X,'TOO MANY POINTS ARE OUTSIDE RANGE; INCREASE DELTA')
   10 CONTINUE
C TOTAL HISTOGRAM POINTS (THOSE ABOVE BASE)
      NUM=0
      DO 30 I=1,100
      NUM=NUM+JHIST(I)
   30 CONTINUE
      NUM=NUM+IEXCES
      S=FLOAT(NUM)
C FILL ABSCISSA, INDIVIDUAL, AND CUMULATIVE FREQUENCY VECTORS
      SUM=0.0
      DO 40 I=1,100
      XI(I)=(FLOAT(I))*DELTA+BASE
      PVAL(I)=(FLOAT(JHIST(I))*100.0)/S
      SUM=SUM+PVAL(I)
      CUMVAL(I)=SUM
   40 CONTINUE
C CLEAR LINE ARRAY
      DO 50 K=1,50
      LINE(K)=IBLANK
   50 CONTINUE
C PRINT RESULTS
      WRITE(6,1999)
      WRITE(6,2000) DELTA
      WRITE(6,2001) BASE,ILOW,IZERO
      WRITE(6,2002)
```

```
      DO 60 I=1,100
      Z=PVAL(I)+0.5
      M=IFIX(Z)
      IF(M.EQ.0)   GO TO 80
      IF(M.GT.50)  M=50
C...FILL LINE ARRAY WITH INDIVIDUAL FREQUENCIES
      DO 70 J=1,M
      LINE(J)=MARK1
   70 CONTINUE
   80 CONTINUE
C...FILL LINE ARRAY WITH CUMULATIVE FREQUENCIES
      Q=(CUMVAL(I)/2.)+0.5
      L=IFIX(Q)
      IF(L.NE.0)   LINE(L)=MARK2
C...PRINT ONE LINE
      A=XI(I)-DELTA
      B=XI(I)
      IC=JHIST(I)
      D=PVAL(I)
      E=CUMVAL(I)
      IF(DELTA.LT.0.1) WRITE(6,2003) A,B,IC,D,(LINE(K),K=1,50),E
      IF(DELTA.GE.0.1) WRITE(6,2004) A,B,IC,D,(LINE(K),K=1,50),E
C...CLEAR LINE ARRAY
      IF(M.EQ.0)   GO TO 90
      DO 90 K=1,M
      LINE(K)=IBLANK
   90 CONTINUE
      IF(L.NE.0)   LINE(L)=IBLANK
C...CHANGE PAGE
      IF(I.NE.50)   GO TO 60
      WRITE(6,2005)
      WRITE(6,1999)
      WRITE(6,2002)
   60 CONTINUE
C...PRINT BOTTOM OF GRAPH
      WRITE(6,2005)
C...PRINT NO. OF VALUES ABOVE RANGE
      PEXCES=(FLOAT(IEXCES)/S)*100.0
      TOP=XI(100)
      WRITE(6,2006) TOP,IEXCES,PEXCES
 1999 FORMAT(1H1)
 2000 FORMAT(1H0,22X,        '*  *  *   DISTRIBUTION OF DATA (INTERVAL WI
     1DTH =',F8.4,')   *  *  *')
C...IF INSTR=1, PRINT VALUES ABOVE THE RANGE
      IF(INSTR.NE.1)   GO TO 110
      IF(IEXCES.EQ.0)  GO TO 110
      IF(IEXCES.GT.1000)  GO TO 110
      WRITE(6,2007)
      DO 100 I=1,IEXCES
      WRITE(6,2008) I,HIVAL(I)
  100 CONTINUE
  110 CONTINUE
 2001 FORMAT(1H0,2X,'NO. OF VALUES LESS THAN ',F8.4,'=',I6,5X,
     1'NO. OF ZERO VALUES =',I6)
 2002 FORMAT(1H0,5X,'INTERVAL',5X,'NUMBER',3X,'PERCENT',
     12X,'+----------------------HISTOGRAM--------------------+',
     21X,'CUM. FREQ.')
 2003 FORMAT(1H ,1X,F7.4,'=',F7.4,1X,I7,2X,F7.3,
     1'%',2X,'I',50A1,'I',1X,F7.3,'%')
```

```
2004 FORMAT(1H ,1X,F7.2,'-',F6.2,1X,I8,2X,F7.3,
    1'%',2X,'I',50A1,'I',1X,F7.3,'%')
2005 FORMAT(1H ,36X,'+----------------------------------------------------
    1-+')
2006 FORMAT(1H0,2X,'NO. OF VALUES EQUAL TO OR GREATER THAN ',F9.4,
    1' =',I5,2X,'(',F6.3,'%)')
2007 FORMAT(1H1,///,8X,'LISTING OF VALUES ABOVE RANGE:',//)
2008 FORMAT(1H0,12X,I4,5X,F14.6)
     RETURN
     END
```

APPENDIX B

SAMPLE OUTPUT OF INDEX.PLOT USING
DATA FROM NEWARK, NEW JERSEY, 1974

TITLE OF DATA SET: 313480002F01 NEWARK NJ CO=MG/M3 OX=PPM NO2=PPM SO2=UG/M3 TSP=UG/M3

	DATE	CO	O3	NO2	SO2	TSP	TSPXSO2
1	010174	2.60	0.0	0.04	64.00	999.99	999.99
2	010274	5.10	0.01	0.08	34.00	999.99	999.99
3	010374	7.70	0.02	0.07	999.99	999.99	999.99
4	010474	4.50	999.99	999.99	999.99	999.99	999.99
5	010574	8.50	0.01	0.06	79.00	999.99	999.99
6	010674	4.30	0.01	0.06	148.00	999.99	999.99
7	010774	6.80	0.01	0.05	142.00	999.99	999.99
8	010874	6.70	0.01	0.04	45.00	999.99	999.99
9	010974	4.40	0.01	0.05	104.00	999.99	999.99
10	011074	5.80	0.01	0.05	112.00	999.99	999.99
11	011174	12.10	0.01	0.05	132.00	999.99	999.99
12	011274	4.40	0.01	0.03	60.00	999.99	999.99
13	011374	2.70	0.0	0.03	55.00	999.99	999.99
14	011474	10.50	0.0	0.05	122.00	999.99	999.99
15	011574	14.40	0.01	0.06	126.00	999.99	999.99
16	011674	19.10	0.04	0.06	113.00	999.99	999.99
17	011774	3.90	0.01	0.03	68.00	999.99	999.99
18	011874	9.30	0.01	0.05	171.00	999.99	999.99
19	011974	6.00	0.01	0.04	118.00	999.99	999.99
20	012074	4.40	0.01	0.05	103.00	999.99	999.99
21	012174	15.70	0.01	0.05	97.00	999.99	999.99
22	012274	9.50	0.01	0.04	73.00	999.99	999.99
23	012374	11.90	0.01	0.07	155.00	999.99	999.99
24	012474	3.70	0.01	0.04	47.00	999.99	999.99
25	012574	10.70	0.01	0.05	92.00	999.99	999.99
26	012674	10.10	0.01	0.09	226.00	999.99	999.99
27	012774	4.30	0.01	0.04	53.00	999.99	999.99
28	012874	8.90	0.01	0.07	122.00	999.99	999.99
29	012974	5.00	0.01	0.04	53.00	999.99	999.99
30	013074	11.20	0.01	0.08	179.00	999.99	999.99
31	013174	9.70	0.01	0.07	174.00	999.99	999.99
32	020174	3.70	0.01	0.02	55.00	999.99	999.99
33	020274	4.00	999.99	0.04	131.00	999.99	999.99
34	020374	2.10	999.99	0.03	91.00	999.99	999.99
35	020474	2.70	0.01	0.03	73.00	999.99	999.99
36	020574	2.60	0.01	0.01	37.00	999.99	999.99
37	020674	6.50	0.01	0.05	126.00	999.99	999.99
38	020774	4.40	0.01	0.04	104.00	999.99	999.99
39	020874	5.00	0.01	0.03	84.00	999.99	999.99
40	020974	2.50	0.01	0.03	61.00	999.99	999.99
41	021074	3.80	999.99	999.99	97.00	999.99	999.99
42	021174	2.90	0.02	0.02	71.00	999.99	999.99
43	021274	6.30	0.01	0.03	112.00	999.99	999.99
44	021374	12.50	0.01	0.05	190.00	999.99	999.99
45	021474	3.40	0.01	0.03	76.00	999.99	999.99
46	021574	4.00	0.01	0.04	88.00	999.99	999.99
47	021674	4.00	0.01	0.04	154.00	999.99	999.99
48	021774	1.50	0.02	0.01	52.00	52.00	8008.00
49	021874	4.00	0.02	0.02	52.00	999.99	999.99
50	021974	5.90	0.01	0.03	56.00	999.99	999.99
51	022074	3.30	0.01	0.02	132.00	999.99	999.99
52	022174	6.60	0.01	0.05	98.00	999.99	999.99
53	022274	6.10	0.02	0.03	129.00	999.99	999.99
54	022374	999.99	999.99	999.99	97.00	999.99	999.99
55	022474	999.99	999.99	999.99	999.99	999.99	999.99
56	022574	1.70	999.99	999.99	999.99	999.99	999.99
57	022674	2.70	999.99	0.02	71.00	999.99	999.99
58	022774	7.50	999.99	0.05	111.00	999.99	999.99
59	022874	7.30	999.99	0.05	130.00	115.00	14950.00
60	030174	3.30	0.01	0.01	68.00	999.99	999.99

61	030274	5.90	0.01	0.05	94.00	999.99	999.99
62	030374	4.90	0.01	0.05	126.00	999.99	999.99
63	030474	17.50	0.02	0.01	142.00	999.99	999.99
64	030574	3.80	0.01	0.04	32.00	999.99	999.99
65	030674	7.20	0.01	0.06	89.00	999.99	999.99
66	030774	6.90	0.01	0.05	70.00	999.99	999.99
67	030874	5.00	0.01	0.05	55.00	999.99	999.99
68	030974	6.30	0.01	0.05	98.00	999.99	999.99
69	031074	1.50	999.99	999.99	999.99	999.99	999.99
70	031174	3.10	0.01	0.03	51.00	999.99	999.99
71	031274	2.30	0.01	0.04	45.00	58.00	2610.00
72	031374	1.70	999.99	0.03	999.99	999.99	999.99
73	031474	999.99	999.99	999.99	999.99	999.99	999.99
74	031574	4.90	999.99	999.99	999.99	999.99	999.99
75	031674	5.90	0.01	0.05	83.00	999.99	999.99
76	031774	2.00	0.01	0.01	41.00	999.99	999.99
77	031874	4.50	999.99	0.03	36.00	999.99	999.99
78	031974	5.70	0.01	0.05	999.99	999.99	999.99
79	032074	5.10	0.01	0.07	999.99	999.99	999.99
80	032174	4.30	999.99	0.04	79.00	999.99	999.99
81	032274	7.00	999.99	0.04	72.00	999.99	999.99
82	032374	4.50	0.01	0.06	95.00	999.99	999.99
83	032474	3.00	999.99	0.04	60.00	31.00	1860.00
84	032574	6.00	999.99	0.04	67.00	999.99	999.99
85	032674	6.50	0.01	0.06	140.00	999.99	999.99
86	032774	3.10	999.99	0.04	51.00	999.99	999.99
87	032874	2.10	999.99	0.04	47.00	999.99	999.99
88	032974	9.40	0.01	0.06	112.00	999.99	999.99
89	033074	4.00	999.99	0.04	65.00	999.99	999.99
90	033174	3.00	999.99	0.02	36.00	999.99	999.99
91	040174	5.80	0.01	0.04	59.00	999.99	999.99
92	040274	6.30	0.02	0.08	999.99	999.99	999.99
93	040374	999.99	999.99	999.99	999.99	999.99	999.99
94	040474	6.30	999.99	999.99	999.99	999.99	999.99
95	040574	5.90	0.01	0.04	34.00	36.00	1224.00
96	040674	4.40	999.99	0.03	36.00	999.99	999.99
97	040774	3.30	0.01	0.05	57.00	999.99	999.99
98	040874	5.70	0.01	0.06	60.00	999.99	999.99
99	040974	3.10	0.01	0.04	46.00	999.99	999.99
100	041074	3.50	0.01	0.04	42.00	999.99	999.99
101	041174	5.80	0.01	0.06	57.00	999.99	999.99
102	041274	6.20	0.01	0.09	114.00	999.99	999.99
103	041374	12.20	0.01	0.07	113.00	999.99	999.99
104	041474	4.00	999.99	0.05	999.99	999.99	999.99
105	041574	2.90	0.01	0.03	999.99	999.99	999.99
106	041674	2.90	0.01	0.03	29.00	999.99	999.99
107	041774	5.50	999.99	0.05	999.99	67.00	999.99
108	041874	3.90	999.99	0.06	35.00	999.99	999.99
109	041974	5.20	999.99	0.06	44.00	999.99	999.99
110	042074	5.10	999.99	999.99	999.99	999.99	999.99
111	042174	4.00	999.99	999.99	999.99	999.99	999.99
112	042274	7.00	0.01	0.08	999.99	999.99	999.99
113	042374	5.20	0.01	0.04	17.00	999.99	999.99
114	042474	2.30	999.99	0.06	14.00	999.99	999.99
115	042574	1.30	999.99	0.06	999.99	999.99	999.99
116	042674	2.70	0.01	0.03	999.99	999.99	999.99
117	042774	4.40	0.01	0.07	29.00	999.99	999.99
118	042874	4.60	0.01	0.06	25.00	999.99	999.99
119	042974	7.80	0.01	0.07	27.00	108.00	2916.00
120	043074	3.60	0.01	0.06	14.00	999.99	999.99
121	050174	2.50	0.03	0.04	16.00	999.99	999.99

122	050274	4.00	0.03	0.05	25.00	999.99	999.99
123	050374	7.60	0.01	0.06	39.00	999.99	999.99
124	050474	2.50	0.02	0.03	16.00	999.99	999.99
125	050574	1.80	0.02	0.04	15.00	999.99	999.99
126	050674	5.00	0.01	0.06	32.00	999.99	999.99
127	050774	4.30	0.02	0.04	28.00	999.99	999.99
128	050874	3.80	0.02	0.06	34.00	999.99	999.99
129	050974	3.10	0.03	0.07	35.00	80.00	2800.00
130	051074	6.80	0.01	0.09	52.00	999.99	999.99
131	051174	4.30	0.04	0.05	36.00	999.99	999.99
132	051274	2.80	0.04	0.04	34.00	999.99	999.99
133	051374	3.50	0.03	0.04	21.00	999.99	999.99
134	051474	6.40	0.02	0.07	51.00	999.99	999.99
135	051574	5.90	0.04	0.06	34.00	999.99	999.99
136	051674	4.10	0.06	0.08	999.99	999.99	999.99
137	051774	5.70	0.04	0.06	37.00	999.99	999.99
138	051874	4.10	0.04	0.05	32.00	999.99	999.99
139	051974	2.50	0.03	0.04	36.00	999.99	999.99
140	052074	3.10	0.03	0.07	32.00	999.99	999.99
141	052174	5.70	0.04	0.14	40.00	999.99	999.99
142	052274	7.00	0.04	0.07	34.00	999.99	999.99
143	052374	10.50	0.01	0.24	51.00	93.00	4743.00
144	052474	5.10	999.99	0.07	36.00	999.99	999.99
145	052574	3.90	0.01	0.05	16.00	999.99	999.99
146	052674	2.70	0.01	0.03	14.00	999.99	999.99
147	052774	2.70	999.99	0.05	18.00	999.99	999.99
148	052874	3.30	0.01	0.04	18.00	999.99	999.99
149	052974	6.60	0.01	0.07	23.00	999.99	999.99
150	053074	7.30	0.01	0.07	42.00	999.99	999.99
151	053174	5.00	0.01	0.06	23.00	999.99	999.99
152	060174	6.10	0.01	0.06	999.99	999.99	999.99
153	060274	4.10	0.01	0.07	999.99	999.99	999.99
154	060374	6.70	0.01	0.07	999.99	999.99	999.99
155	060474	11.10	0.01	0.07	50.00	999.99	999.99
156	060574	8.70	0.02	0.06	40.00	86.00	3440.00
157	060674	4.60	0.03	0.05	57.00	999.99	999.99
158	060774	5.10	0.01	0.04	91.00	999.99	999.99
159	060874	6.80	0.01	0.05	86.00	999.99	999.99
160	060974	6.00	0.02	0.04	50.00	999.99	999.99
161	061074	5.20	0.02	0.04	32.00	999.99	999.99
162	061174	4.30	0.01	0.03	23.00	999.99	999.99
163	061274	5.70	0.01	0.06	42.00	999.99	999.99
164	061374	4.80	0.01	0.06	47.00	999.99	999.99
165	061474	6.20	0.01	0.06	33.00	999.99	999.99
166	061574	3.80	0.02	0.05	27.00	999.99	999.99
167	061674	1.90	0.02	0.02	13.00	59.00	767.00
168	061774	5.90	0.01	0.05	26.00	999.99	999.99
169	061874	4.40	0.01	0.06	999.99	999.99	999.99
170	061974	6.10	0.02	0.06	35.00	999.99	999.99
171	062074	7.30	0.03	0.05	21.00	999.99	999.99
172	062174	11.40	0.01	0.08	40.00	999.99	999.99
173	062274	5.50	0.02	0.04	16.00	999.99	999.99
174	062374	4.50	0.01	0.04	17.00	999.99	999.99
175	062474	5.50	0.01	0.05	15.00	999.99	999.99
176	062574	6.20	0.01	0.05	14.00	999.99	999.99
177	062674	6.10	0.01	0.06	28.00	999.99	999.99
178	062774	5.50	0.01	0.07	58.00	62.00	3596.00
179	062874	5.90	0.01	0.05	26.00	999.99	999.99
180	062974	6.60	0.02	0.05	25.00	999.99	999.99
181	063074	4.00	0.03	0.03	28.00	999.99	999.99
182	070174	5.20	0.02	0.04	18.00	999.99	999.99

183	070274	8.20	0.03	0.06	26.00	999.99	999.99
184	070374	9.30	0.02	0.06	45.00	999.99	999.99
185	070474	5.70	0.04	0.04	47.00	999.99	999.99
186	070574	8.70	0.01	0.06	42.00	999.99	999.99
187	070674	5.10	0.02	0.05	35.00	999.99	999.99
188	070774	4.00	0.03	0.03	14.00	999.99	999.99
189	070874	4.10	0.02	0.04	19.00	999.99	999.99
190	070974	4.40	0.04	0.04	20.00	999.99	999.99
191	071074	4.20	0.03	0.04	32.00	52.00	1664.00
192	071174	2.90	0.01	0.02	14.00	999.99	999.99
193	071274	3.70	0.01	0.03	14.00	999.99	999.99
194	071374	2.90	0.02	0.04	14.00	999.99	999.99
195	071474	4.50	0.06	0.03	19.00	999.99	999.99
196	071574	4.20	0.04	0.03	25.00	999.99	999.99
197	071674	3.20	0.02	0.03	13.00	999.99	999.99
198	071774	3.60	0.03	0.04	16.00	999.99	999.99
199	071874	7.40	0.02	0.08	32.00	999.99	999.99
200	071974	4.70	0.03	0.04	19.00	999.99	999.99
201	072074	3.20	0.02	0.02	13.00	999.99	999.99
202	072174	4.70	0.03	0.04	21.00	999.99	999.99
203	072274	5.20	0.03	0.07	28.00	63.00	1764.00
204	072374	5.10	0.01	0.05	40.00	999.99	999.99
205	072474	6.10	0.01	0.06	28.00	999.99	999.99
206	072574	5.40	999.99	0.06	27.00	999.99	999.99
207	072674	5.50	0.01	0.07	999.99	999.99	999.99
208	072774	6.90	0.02	0.07	31.00	999.99	999.99
209	072874	5.30	0.02	0.06	47.00	999.99	999.99
210	072974	6.10	0.01	0.04	30.00	999.99	999.99
211	073074	6.00	0.03	0.04	16.00	999.99	999.99
212	073174	6.60	0.03	0.06	21.00	999.99	999.99
213	080174	6.80	0.03	0.06	42.00	116.00	4872.00
214	080274	7.60	0.02	0.11	44.00	999.99	999.99
215	080374	7.50	0.01	0.03	21.00	999.99	999.99
216	080474	5.20	0.01	0.02	14.00	999.99	999.99
217	080574	5.90	0.02	0.03	18.00	999.99	999.99
218	080674	5.40	0.03	0.06	28.00	999.99	999.99
219	080774	7.30	0.01	0.07	999.99	999.99	999.99
220	080874	6.60	0.03	0.05	999.99	999.99	999.99
221	080974	8.10	0.02	0.06	999.99	999.99	999.99
222	081074	5.30	0.01	0.04	24.00	999.99	999.99
223	081174	4.70	0.02	0.03	27.00	999.99	999.99
224	081274	6.30	0.03	0.06	29.00	999.99	999.99
225	081374	7.00	0.03	0.09	999.99	999.99	999.99
226	081474	4.60	0.03	0.03	999.99	999.99	999.99
227	081574	5.60	0.02	0.04	20.00	59.00	1180.00
228	081674	6.80	0.02	0.07	25.00	999.99	999.99
229	081774	6.60	0.02	0.05	26.00	999.99	999.99
230	081874	3.80	0.03	0.03	13.00	999.99	999.99
231	081974	5.50	0.03	0.06	19.00	999.99	999.99
232	082074	8.40	0.01	0.09	40.00	999.99	999.99
233	082174	8.80	0.01	0.08	39.00	999.99	999.99
234	082274	4.50	0.01	0.06	33.00	999.99	999.99
235	082374	10.10	0.03	0.06	32.00	999.99	999.99
236	082474	6.60	0.02	0.05	32.00	999.99	999.99
237	082574	5.40	0.03	0.02	13.00	999.99	999.99
238	082674	9.20	0.01	0.06	28.00	999.99	999.99
239	082774	11.30	0.02	0.06	22.00	70.00	1540.00
240	082874	10.40	0.02	0.06	28.00	999.99	999.99
241	082974	11.00	0.02	0.08	41.00	999.99	999.99
242	083074	7.80	0.01	0.05	15.00	999.99	999.99
243	083174	11.80	0.03	0.06	39.00	999.99	999.99

244	090174	5.30	0.05	0.03	24.00	999.99	999.99
245	090274	6.30	0.01	0.03	14.00	999.99	999.99
246	090374	10.90	0.01	0.08	999.99	999.99	999.99
247	090474	4.40	999.99	0.02	999.99	999.99	999.99
248	090574	8.60	0.01	0.05	13.00	999.99	999.99
249	090674	7.80	0.01	0.07	35.00	999.99	999.99
250	090774	8.30	0.01	0.05	17.00	999.99	999.99
251	090874	7.70	0.03	0.07	48.00	999.99	999.99
252	090974	12.90	0.02	0.08	36.00	82.00	2952.00
253	091074	15.10	0.02	0.07	26.00	999.99	999.99
254	091174	14.30	0.02	0.17	58.00	999.99	999.99
255	091274	10.30	0.01	0.06	999.99	999.99	999.99
256	091374	13.00	0.01	0.06	999.99	999.99	999.99
257	091474	5.00	0.01	0.02	13.00	999.99	999.99
258	091574	3.30	0.01	0.03	999.99	999.99	999.99
259	091674	6.60	0.01	0.04	999.99	999.99	999.99
260	091774	9.70	0.01	0.09	50.00	999.99	999.99
261	091874	6.10	0.01	0.05	23.00	999.99	999.99
262	091974	8.30	0.02	0.07	49.00	98.00	4802.00
263	092074	15.80	0.01	0.07	41.00	999.99	999.99
264	092174	9.70	0.01	0.05	34.00	999.99	999.99
265	092274	3.70	0.01	0.02	14.00	999.99	999.99
266	092374	3.80	0.01	0.03	13.00	999.99	999.99
267	092474	9.50	999.99	0.06	38.00	999.99	999.99
268	092574	13.50	0.01	0.07	50.00	999.99	999.99
269	092674	14.00	0.01	0.08	63.00	999.99	999.99
270	092774	17.00	0.02	999.99	48.00	999.99	999.99
271	092874	8.80	0.01	999.99	32.00	999.99	999.99
272	092974	6.10	0.01	999.99	23.00	999.99	999.99
273	093074	5.10	0.01	999.99	999.99	999.99	999.99
274	101074	6.00	0.01	0.04	26.00	999.99	999.99
275	100274	4.20	0.01	0.04	34.00	32.00	1088.00
276	100374	4.40	999.99	0.03	15.00	999.99	999.99
277	100474	13.30	0.01	0.03	36.00	999.99	999.99
278	100574	11.90	0.01	999.99	86.00	999.99	999.99
279	100674	7.50	0.02	999.99	62.00	999.99	999.99
280	100774	10.20	0.01	999.99	999.99	999.99	999.99
281	100874	8.50	0.01	0.05	33.00	999.99	999.99
282	100974	11.80	0.01	0.07	56.00	999.99	999.99
283	101074	10.30	0.01	0.08	999.99	999.99	999.99
284	101174	10.40	0.01	0.08	49.00	999.99	999.99
285	101274	10.90	0.01	0.08	44.00	999.99	999.99
286	101374	4.30	0.01	0.04	28.00	999.99	999.99
287	101474	4.40	0.01	0.03	999.99	999.99	999.99
288	101574	8.20	0.01	0.04	999.99	999.99	999.99
289	101674	4.90	999.99	999.99	999.99	38.00	999.99
290	101774	12.90	999.99	999.99	999.99	999.99	999.99
291	101874	4.90	0.01	0.04	17.00	999.99	999.99
292	101974	6.20	0.01	0.04	27.00	999.99	999.99
293	102074	3.00	0.01	0.02	999.99	999.99	999.99
294	102174	999.99	999.99	999.99	999.99	999.99	999.99
295	102274	999.99	999.99	999.99	999.99	999.99	999.99
296	102374	999.99	999.99	999.99	999.99	999.99	999.99
297	102474	999.99	999.99	999.99	999.99	105.00	999.99
298	102574	999.99	999.99	999.99	999.99	999.99	999.99
299	102674	999.99	999.99	999.99	999.99	999.99	999.99
300	102774	999.99	999.99	999.99	999.99	999.99	999.99
301	102874	7.50	999.99	999.99	999.99	999.99	999.99
302	102974	999.99	999.99	999.99	999.99	999.99	999.99
303	103074	11.10	0.01	0.08	999.99	999.99	999.99
304	103174	18.20	0.01	0.07	84.00	999.99	999.99

305	110174	14.30	0.01	0.06	59.00	999.99	999.99
306	110274	9.40	0.01	0.03	20.00	999.99	999.99
307	110374	9.00	0.01	0.03	35.00	999.99	999.99
308	110474	13.60	0.01	0.05	48.00	999.99	999.99
309	110574	999.99	999.99	999.99	999.99	999.99	999.99
310	110674	6.00	0.01	0.02	999.99	999.99	999.99
311	110774	6.40	0.01	0.02	34.00	37.00	1258.00
312	110874	8.00	0.01	999.99	999.99	999.99	999.99
313	110974	5.90	0.02	0.02	26.00	999.99	999.99
314	111074	5.50	0.01	0.02	999.99	999.99	999.99
315	111174	5.50	999.99	999.99	999.99	999.99	999.99
316	111274	6.20	999.99	999.99	999.99	999.99	999.99
317	111374	14.20	999.99	999.99	999.99	999.99	999.99
318	111474	11.60	999.99	0.05	68.00	999.99	999.99
319	111574	6.60	0.01	0.04	999.99	999.99	999.99
320	111674	7.50	0.01	0.05	79.00	999.99	999.99
321	111774	7.70	999.99	0.08	149.00	999.99	999.99
322	111874	13.50	0.01	0.07	999.99	999.99	999.99
323	111974	16.20	0.01	0.20	146.00	84.00	12264.00
324	112074	13.70	0.01	0.05	65.00	999.99	999.99
325	112174	7.00	0.01	0.03	35.00	999.99	999.99
326	112274	5.60	0.01	0.03	18.00	999.99	999.99
327	112374	13.10	0.01	0.07	72.00	999.99	999.99
328	112474	12.70	0.01	0.08	92.00	999.99	999.99
329	112574	11.80	0.01	0.06	71.00	999.99	999.99
330	112674	4.90	0.01	0.02	13.00	999.99	999.99
331	112774	10.10	0.01	0.05	52.00	999.99	999.99
332	112874	3.70	999.99	0.05	118.00	999.99	999.99
333	112974	5.50	0.01	0.03	41.00	999.99	999.99
334	113074	5.60	0.01	0.05	54.00	999.99	999.99
335	120174	2.10	0.02	0.02	999.99	999.99	999.99
336	120274	2.10	0.01	0.02	999.99	42.00	999.99
337	120374	1.80	0.01	0.03	999.99	999.99	999.99
338	120474	1.90	0.01	0.03	31.00	999.99	999.99
339	120574	10.10	999.99	0.06	97.00	999.99	999.99
340	120674	14.70	999.99	0.08	165.00	999.99	999.99
341	120774	7.40	0.01	0.06	113.00	999.99	999.99
342	120874	4.80	0.02	0.02	28.00	999.99	999.99
343	120974	6.70	0.01	0.03	45.00	999.99	999.99
344	121074	2.10	0.01	0.03	50.00	999.99	999.99
345	121174	6.60	999.99	999.99	999.99	999.99	999.99
346	121274	10.10	0.01	0.06	57.00	95.00	5415.00
347	121374	7.50	999.99	0.07	83.00	999.99	999.99
348	121474	2.60	999.99	999.99	999.99	999.99	999.99
349	121574	1.20	999.99	999.99	999.99	999.99	999.99
350	121674	4.80	0.01	0.02	65.00	999.99	999.99
351	121774	6.30	999.99	0.03	999.99	999.99	999.99
352	121874	3.60	999.99	0.03	63.00	999.99	999.99
353	121974	5.60	999.99	0.03	97.00	999.99	999.99
354	122074	7.60	999.99	0.04	77.00	999.99	999.99
355	122174	3.00	999.99	0.05	112.00	999.99	999.99
356	122274	3.20	999.99	0.03	999.99	999.99	999.99
357	122374	11.20	0.01	0.04	999.99	999.99	999.99
358	122474	5.20	999.99	0.07	72.00	999.99	999.99
359	122574	2.80	0.01	0.03	49.00	999.99	999.99
360	122674	3.60	0.01	0.03	47.00	66.00	3102.00
361	122774	6.60	999.99	0.04	102.00	999.99	999.99
362	122874	2.40	0.01	0.04	50.00	999.99	999.99
363	122974	2.40	999.99	999.99	999.99	999.99	999.99
364	123074	6.00	999.99	0.03	66.00	999.99	999.99
365	123174	11.00	999.99	0.04	80.00	999.99	999.99

OF 365 RECORDS, THE FOLLOWING MISSING VALUES WERE OBSERVED:

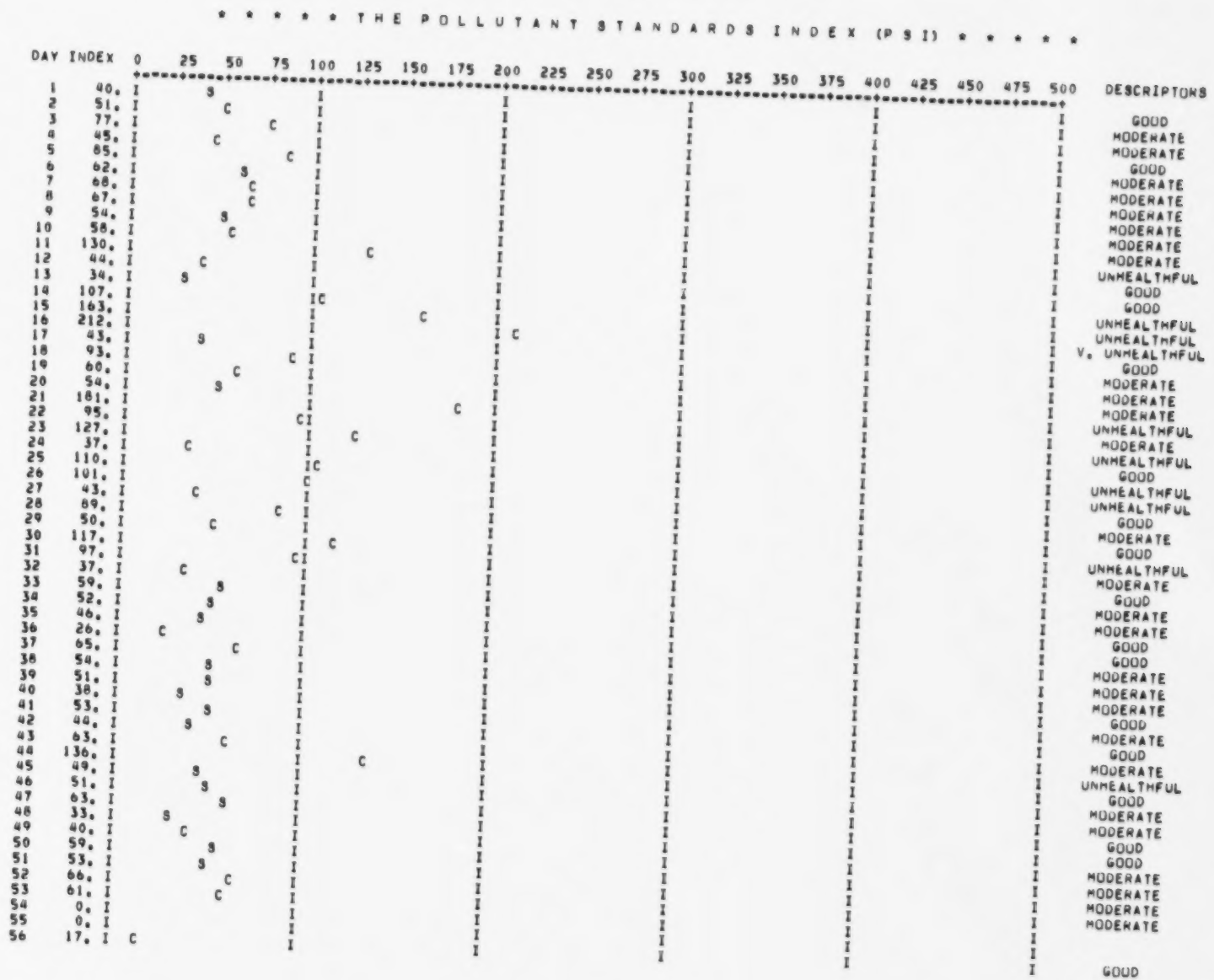
CO MISSING VALUES: 13

O3 MISSING VALUES: 75

NO2 MISSING VALUES: 39

SO2 MISSING VALUES: 76

TSP MISSING VALUES: 338


* * * * * THE POLLUTANT STANDARDS INDEX (PSI) * * * * *
DAY INDEX
0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500
DESCRIPTONS
1 40. GOOD
2 51. MODERATE
3 77. MODERATE
4 45. GOOD
5 85. MODERATE
6 62. MODERATE
7 68. MODERATE
8 67. MODERATE
9 54. MODERATE
10 58. MODERATE
11 130. MODERATE
12 44. UNHEALTHFUL
13 34. GOOD
14 107. GOOD
15 163. UNHEALTHFUL
16 212. UNHEALTHFUL
17 43. V. UNHEALTHFUL
18 93. GOOD
19 60. MODERATE
20 54. MODERATE
21 181. MODERATE
22 95. UNHEALTHFUL
23 127. MODERATE
24 37. UNHEALTHFUL
25 110. GOOD
26 101. UNHEALTHFUL
27 43. UNHEALTHFUL
28 89. GOOD
29 50. MODERATE
30 117. GOOD
31 97. UNHEALTHFUL
32 37. MODERATE
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35 46. MODERATE
36 26. GOOD
37 65. GOOD
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301 75. MODERATE
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306 94. MODERATE
307 90. UNHEALTHFUL
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310 60. MODERATE
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322 150. UNHEALTHFUL
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324 153. UNHEALTHFUL
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326 56. MODERATE
327 144. UNHEALTHFUL
328 139. UNHEALTHFUL
329 126. UNHEALTHFUL
330 49. GOOD
331 101. UNHEALTHFUL
332 57. MODERATE
333 55. MODERATE
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335 25. GOOD
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337 18. GOOD
338 19. GOOD
339 101. UNHEALTHFUL
340 167. UNHEALTHFUL
341 74. MODERATE
342 48. GOOD
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346 101. UNHEALTHFUL
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350 46. GOOD
351 63. MODERATE
352 39. GOOD
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354 76. MODERATE
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356 32. GOOD
357 117. UNHEALTHFUL
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SUMMARY OF RESULTS BY SUBINDEX AND BY DESCRIPTOR:

	GOOD	MODERATE	UNHEALTHFUL	V. UNHEALTHFUL	HAZARDOUS	TOTAL
CO:	139	157	52	4	0	352
O3:	287	3	0	0	0	290
NO2:	326	0	0	0	0	326
SO2:	229	60	0	0	0	289
TSP:	16	11	0	0	0	27
TSPXSO2:	23	0	0	0	0	23
PSI:	121	176	52	4	0	353

RESULTS EXPRESSED AS A PERCENTAGE:

	GOOD	MODERATE	UNHEALTHFUL	V. UNHEALTHFUL	HAZARDOUS	TOTAL
CO:	39.5	44.6	14.8	1.1	0.0	100.0
O3:	99.0	1.0	0.0	0.0	0.0	100.0
NO2:	100.0	0.0	0.0	0.0	0.0	100.0
SO2:	79.2	20.8	0.0	0.0	0.0	100.0
TSP:	59.3	40.7	0.0	0.0	0.0	100.0
TSPXSO2:	100.0	0.0	0.0	0.0	0.0	100.0
PSI:	34.3	49.9	14.7	1.1	0.0	100.0

SUMMARY OF CRITICAL POLLUTANTS (POLLUTANTS FOR WHICH SUBINDEX WAS MAXIMUM:)

POLLUTANT	NO. OF VALUES	PERCENT
CO	292	82.7
O3	15	4.2
NO2	0	0.0
SO2	40	11.3
TSP	6	1.7
TSPXSO2	0	0.0
TOTAL	353	100.0
MISSING	12	

N = 353

MEAN = 67.4978180

2ND MOMENT (VAR.) = 1309.10791 STANDARD DEV. = 36.1815948

COEFFICIENT OF VARIATION = 0.53604090

3RD MOMENT = 74408.1250 COEF. OF SKEWNESS = 1.57093143

4TH MOMENT = 9576928.00 COEF. OF KURTOSIS = 5.58824444

LOWEST VALUE = 11.9999981

HIGHEST VALUE = 212.352966

* * * DISTRIBUTION OF DATA (INTERVAL WIDTH = 5.0000) * * *

NO. OF VALUES LESS THAN 0.0 = 0 NO. OF ZERO VALUES = 0

INTERVAL	NUMBER	PERCENT	HISTOGRAM	CUM. FREQ.
0.0 - 5.00	0	0.0 %	I	0.0 %
5.00- 10.00	0	0.0 %	I	0.0 %
10.00- 15.00	2	0.567%	I*	0.567%
15.00- 20.00	5	1.416%	I+	1.983%
20.00- 25.00	4	1.133%	I**	3.116%
25.00- 30.00	13	3.683%	I****	6.799%
30.00- 35.00	15	4.249%	I**** +	11.048%
35.00- 40.00	24	6.799%	I******* +	17.847%
40.00- 45.00	28	7.932%	I******** +	25.779%
45.00- 50.00	25	7.082%	I******* +	32.861%
50.00- 55.00	35	9.915%	I********** +	42.776%
55.00- 60.00	36	10.198%	I********** +	52.974%
60.00- 65.00	32	9.065%	I********* +	62.040%
65.00- 70.00	22	6.232%	I****** +	68.272%
70.00- 75.00	14	3.966%	I**** +	72.238%
75.00- 80.00	15	4.249%	I**** +	76.487%
80.00- 85.00	7	1.983%	I** +	78.470%
85.00- 90.00	9	2.550%	I*** +	81.020%
90.00- 95.00	6	1.700%	I** +	82.719%
95.00-100.00	5	1.416%	I* +	84.136%
100.00-105.00	8	2.266%	I** +	86.402%
105.00-110.00	5	1.416%	I* +	87.819%
110.00-115.00	4	1.133%	I* +	88.952%
115.00-120.00	6	1.700%	I** +	90.651%
120.00-125.00	1	0.283%	I +	90.935%
125.00-130.00	5	1.416%	I* +	92.351%
130.00-135.00	2	0.567%	I* +	92.918%
135.00-140.00	2	0.567%	I* +	93.484%
140.00-145.00	4	1.133%	I* +	94.617%
145.00-150.00	3	0.850%	I* +	95.467%
150.00-155.00	2	0.567%	I* +	96.034%
155.00-160.00	2	0.567%	I* +	96.600%
160.00-165.00	3	0.850%	I* +	97.450%
165.00-170.00	1	0.283%	I +	97.733%
170.00-175.00	1	0.283%	I +	98.017%
175.00-180.00	0	0.0 %	I +	98.017%
180.00-185.00	2	0.567%	I* +	98.583%
185.00-190.00	1	0.283%	I +	98.867%
190.00-195.00	0	0.0 %	I +	98.867%
195.00-200.00	0	0.0 %	I +	98.867%
200.00-205.00	2	0.567%	I* +	99.433%
205.00-210.00	1	0.283%	I +	99.716%
210.00-215.00	1	0.283%	I +	100.000%
215.00-220.00	0	0.0 %	I +	100.000%
220.00-225.00	0	0.0 %	I +	100.000%
225.00-230.00	0	0.0 %	I +	100.000%
230.00-235.00	0	0.0 %	I +	100.000%
235.00-240.00	0	0.0 %	I +	100.000%
240.00-245.00	0	0.0 %	I +	100.000%
245.00-250.00	0	0.0 %	I +	100.000%

INTERVAL	NUMBER	PERCENT	+----------HISTOGRAM----------+	CUM. FREQ.
250.00-255.00	0	0.0 %	I	+I 100.000%
255.00-260.00	0	0.0 %	I	+I 100.000%
260.00-265.00	0	0.0 %	I	+I 100.000%
265.00-270.00	0	0.0 %	I	+I 100.000%
270.00-275.00	0	0.0 %	I	+I 100.000%
275.00-280.00	0	0.0 %	I	+I 100.000%
280.00-285.00	0	0.0 %	I	+I 100.000%
285.00-290.00	0	0.0 %	I	+I 100.000%
290.00-295.00	0	0.0 %	I	+I 100.000%
295.00-300.00	0	0.0 %	I	+I 100.000%
300.00-305.00	0	0.0 %	I	+I 100.000%
305.00-310.00	0	0.0 %	I	+I 100.000%
310.00-315.00	0	0.0 %	I	+I 100.000%
315.00-320.00	0	0.0 %	I	+I 100.000%
320.00-325.00	0	0.0 %	I	+I 100.000%
325.00-330.00	0	0.0 %	I	+I 100.000%
330.00-335.00	0	0.0 %	I	+I 100.000%
335.00-340.00	0	0.0 %	I	+I 100.000%
340.00-345.00	0	0.0 %	I	+I 100.000%
345.00-350.00	0	0.0 %	I	+I 100.000%
350.00-355.00	0	0.0 %	I	+I 100.000%
355.00-360.00	0	0.0 %	I	+I 100.000%
360.00-365.00	0	0.0 %	I	+I 100.000%
365.00-370.00	0	0.0 %	I	+I 100.000%
370.00-375.00	0	0.0 %	I	+I 100.000%
375.00-380.00	0	0.0 %	I	+I 100.000%
380.00-385.00	0	0.0 %	I	+I 100.000%
385.00-390.00	0	0.0 %	I	+I 100.000%
390.00-395.00	0	0.0 %	I	+I 100.000%
395.00-400.00	0	0.0 %	I	+I 100.000%
400.00-405.00	0	0.0 %	I	+I 100.000%
405.00-410.00	0	0.0 %	I	+I 100.000%
410.00-415.00	0	0.0 %	I	+I 100.000%
415.00-420.00	0	0.0 %	I	+I 100.000%
420.00-425.00	0	0.0 %	I	+I 100.000%
425.00-430.00	0	0.0 %	I	+I 100.000%
430.00-435.00	0	0.0 %	I	+I 100.000%
435.00-440.00	0	0.0 %	I	+I 100.000%
440.00-445.00	0	0.0 %	I	+I 100.000%
445.00-450.00	0	0.0 %	I	+I 100.000%
450.00-455.00	0	0.0 %	I	+I 100.000%
455.00-460.00	0	0.0 %	I	+I 100.000%
460.00-465.00	0	0.0 %	I	+I 100.000%
465.00-470.00	0	0.0 %	I	+I 100.000%
470.00-475.00	0	0.0 %	I	+I 100.000%
475.00-480.00	0	0.0 %	I	+I 100.000%
480.00-485.00	0	0.0 %	I	+I 100.000%
485.00-490.00	0	0.0 %	I	+I 100.000%
490.00-495.00	0	0.0 %	I	+I 100.000%
495.00-500.00	0	0.0 %	I	+I 100.000%
			+----------+	+I 100.000%

NO. OF VALUES EQUAL TO OR GREATER THAN 500.0000 = 0 (0.0 %)

APPENDIX C

RAW DATA FILE FOR NEWARK, NEW JERSEY, 1974

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313480002F01 NEWARK NJ		CO-MG/M3	OX-PPM	NO2-PPM	SO2-UG/M3	TSP-UG/M3
313480002F01 010174	260	00	04	6400	99999	
313480002F01 010274	510	01	04	3400	99999	
313480002F01 010374	770	02	07	99999	99999	
313480002F01 010474	450	99999	99999	99999	99999	
313480002F01 010574	850	01	06	7900	99999	
313480002F01 010674	430	01	06	14800	99999	
313480002F01 010774	680	01	05	14200	99999	
313480002F01 010874	670	01	04	4500	99999	
313480002F01 010974	440	01	05	10400	99999	
313480002F01 011074	580	01	05	11200	99999	
313480002F01 011174	1210	01	05	13200	99999	
313480002F01 011274	440	01	03	6000	99999	
313480002F01 011374	270	00	03	5500	99999	
313480002F01 011474	1050	00	05	12200	99999	
313480002F01 011574	1440	01	06	12600	99999	
313480002F01 011674	1910	04	06	11300	99999	
313480002F01 011774	390	01	03	6800	99999	
313480002F01 011874	930	01	05	17100	99999	
313480002F01 011974	600	01	04	11800	99999	
313480002F01 012074	440	01	05	10300	99999	
313480002F01 012174	1570	01	05	9700	99999	
313480002F01 012274	950	01	04	7300	99999	
313480002F01 012374	1190	01	07	15500	99999	
313480002F01 012474	370	01	04	4700	99999	
313480002F01 012574	1070	01	05	9200	99999	
313480002F01 012674	1010	01	09	22600	99999	
313480002F01 012774	430	01	04	5300	99999	
313480002F01 012874	890	01	07	12200	99999	
313480002F01 012974	500	01	04	5300	99999	
313480002F01 013074	1120	01	08	17900	99999	
313480002F01 013174	970	01	07	17400	99999	
313480002F01 020174	370	01	02	5500	99999	
313480002F01 020274	400	99999	04	13100	99999	
313480002F01 020374	210	99999	03	9100	99999	
313480002F01 020474	270	01	03	7300	99999	
313480002F01 020574	260	01	01	3700	99999	
313480002F01 020674	650	01	05	12600	99999	
313480002F01 020774	440	01	04	10400	99999	
313480002F01 020874	500	01	03	8400	99999	
313480002F01 020974	250	01	03	6100	99999	
313480002F01 021074	380	99999	99999	9700	99999	
313480002F01 021174	290	02	02	7100	99999	
313480002F01 021274	630	01	03	11200	99999	
313480002F01 021374	1250	01	05	19000	99999	
313480002F01 021474	340	01	03	7800	99999	
313480002F01 021574	400	01	04	8800	99999	
313480002F01 021674	400	01	04	15400	5200	
313480002F01 021774	150	02	01	5200	99999	
313480002F01 021874	400	02	02	5800	99999	
313480002F01 021974	560	01	03	13200	99999	
313480002F01 022074	330	01	02	9800	99999	
313480002F01 022174	660	01	05	12900	99999	
313480002F01 022274	610	02	03	9700	99999	
313480002F01 022374	99999	99999	99999	99999	99999	
313480002F01 022474	99999	99999	99999	99999	99999	
313480002F01 022574	170	99999	99999	99999	99999	
313480002F01 022674	270	99999	02	7100	99999	
313480002F01 022774	750	99999	05	11100	99999	

3134800002F01	022874	730	99999	05	13000	11500
3134E0002F01	030174	330	01	01	6800	99999
3134E0002F01	030274	590	01	05	9400	99999
3134800002F01	030374	490	01	05	12600	99999
3134E0002F01	030474	1750	02	01	14200	99999
3134E0002F01	030574	380	01	04	3200	99999
3134800002F01	030674	720	01	06	8900	99999
3134E0002F01	030774	690	01	05	7000	99999
3134800002F01	030874	500	01	05	5500	99999
3134800002F01	030974	630	01	05	9800	99999
3134800002F01	031074	150	99999	99999	99999	99999
3134E0002F01	031174	310	01	03	5100	99999
3134800002F01	031274	230	01	04	4500	5800
3134E0002F01	031374	170	99999	03	99999	99999
3134E0002F01	031474	99999	99999	99999	99999	99999
3134E0002F01	031574	490	99999	99999	99999	99999
3134800002F01	031674	590	01	05	8300	99999
3134E0002F01	031774	200	01	01	4100	99999
3134E0002F01	031874	450	99999	03	3600	99999
3134E0002F01	031974	570	01	05	99999	99999
3134800002F01	032074	510	01	07	99999	99999
3134E0002F01	032174	430	99999	04	7900	99999
3134E0002F01	032274	700	99999	04	7200	99999
3134800002F01	032374	450	01	06	9500	99999
3134E0002F01	032474	300	99999	04	6000	3100
3134E0002F01	032574	600	99999	04	6700	99999
3134E0002F01	032674	850	01	06	14000	99999
3134800002F01	032774	310	99999	04	5100	99999
3134800002F01	032874	210	99999	04	4700	99999
3134E0002F01	032974	940	01	06	11200	99999
3134E0002F01	033074	400	99999	04	6500	99999
3134E0002F01	033174	300	99999	02	3600	99999
3134800002F01	040174	560	01	04	5900	99999
3134800002F01	040274	630	02	06	99999	99999
3134E0002F01	040374	99999	99999	99999	99999	99999
3134800002F01	040474	630	99999	99999	99999	99999
3134E0002F01	040574	590	01	04	3400	3600
3134E0002F01	040674	440	99999	03	3800	99999
3134E0002F01	040774	330	01	05	5700	99999
3134E0002F01	040874	570	01	06	6000	99999
3134E0002F01	040974	310	01	04	4600	99999
3134800002F01	041074	350	01	04	4200	99999
3134800002F01	041174	580	01	06	5700	99999
3134E0002F01	041274	620	01	09	11400	99999
3134E0002F01	041374	1220	01	07	11300	99999
3134800002F01	041474	400	99999	05	99999	99999
3134800002F01	041574	290	01	03	99999	99999
3134800002F01	041674	290	01	03	2900	99999
3134E0002F01	041774	550	99999	05	99999	6700
3134E0002F01	041874	390	99999	06	3500	99999
3134800002F01	041974	520	99999	06	4400	99999
3134800002F01	042074	510	99999	99999	99999	99999
3134E0002F01	042174	400	99999	99999	99999	99999
3134800002F01	042274	700	01	08	99999	99999
3134E0002F01	042374	520	01	04	1700	99999
3134800002F01	042474	230	99999	06	1400	99999
3134E0002F01	042574	130	99999	06	99999	99999
3134800002F01	042674	270	01	03	99999	99999
3134E0002F01	042774	440	01	07	2900	99999
3134800002F01	042874	460	01	06	2500	99999

3134E0002F01	042974	780	01	07	2700	10800
3134E0002F01	043074	380	01	06	1400	99999
3134E0002F01	050174	250	03	04	1600	99999
3134E0002F01	050274	400	03	05	2500	99999
3134E0002F01	050374	760	01	06	3900	99999
3134E0002F01	050474	250	02	03	1600	99999
3134E0002F01	050574	180	02	04	1500	99999
3134E0002F01	050674	500	01	06	3200	99999
3134E0002F01	050774	430	02	04	2800	99999
3134E0002F01	050874	380	02	06	3400	99999
3134E0002F01	050974	310	03	07	3500	8000
3134E0002F01	051074	680	01	09	5200	99999
3134E0002F01	051174	430	04	05	3600	99999
3134E0002F01	051274	280	04	04	3400	99999
3134E0002F01	051374	350	03	04	2100	99999
3134E0002F01	051474	640	02	07	5100	99999
3134E0002F01	051574	590	04	06	3400	99999
3134E0002F01	051674	410	06	08	99999	99999
3134E0002F01	051774	570	04	06	3700	99999
3134E0002F01	051874	410	04	05	3200	99999
3134E0002F01	051974	250	03	04	3600	99999
3134E0002F01	052074	310	03	07	3200	99999
3134E0002F01	052174	570	04	14	4000	99999
3134E0002F01	052274	700	04	07	3400	99999
3134E0002F01	052374	1050	01	24	5100	9300
3134E0002F01	052474	510	99999	07	3600	99999
3134E0002F01	052574	390	01	05	1600	99999
3134E0002F01	052674	270	01	03	1400	99999
3134E0002F01	052774	270	99999	05	1800	99999
3134E0002F01	052874	330	01	04	1800	99999
3134E0002F01	052974	660	01	07	2300	99999
3134E0002F01	053074	730	01	07	4200	99999
3134E0002F01	053174	500	01	06	2300	99999
3134E0002F01	060174	610	01	06	99999	99999
3134E0002F01	060274	410	01	07	99999	99999
3134E0002F01	060374	670	01	07	99999	99999
3134E0002F01	060474	1110	01	07	5000	99999
3134E0002F01	060574	870	02	06	4000	8600
3134E0002F01	060674	460	03	05	5700	99999
3134E0002F01	060774	510	01	04	9100	99999
3134E0002F01	060874	680	01	05	8600	99999
3134E0002F01	060974	600	02	04	5000	99999
3134E0002F01	061074	520	02	04	3200	99999
3134E0002F01	061174	430	01	03	2300	99999
3134E0002F01	061274	570	01	06	4200	99999
3134E0002F01	061374	480	01	06	4700	99999
3134E0002F01	061474	620	01	06	3300	99999
3134E0002F01	061574	380	02	05	2700	99999
3134E0002F01	061674	190	02	02	1300	5900
3134E0002F01	061774	590	01	05	2600	99999
3134E0002F01	061874	440	01	06	99999	99999
3134E0002F01	061974	610	02	06	3500	99999
3134E0002F01	062074	730	03	05	2100	99999
3134E0002F01	062174	1140	01	08	4000	99999
3134E0002F01	062274	550	02	04	1600	99999
3134E0002F01	062374	450	01	04	1700	99999
3134E0002F01	062474	550	01	05	1500	99999
3134E0002F01	062574	620	01	05	1400	99999
3134E0002F01	062674	610	01	06	2800	99999
3134E0002F01	062774	550	01	07	5800	6200

313480002F01	062874	590	01	05	2600	99999
313480002F01	062974	660	02	05	2500	99999
313480002F01	063074	400	03	03	2800	99999
313480002F01	070174	520	02	04	1800	99999
313480002F01	070274	820	03	06	2600	99999
313480002F01	070374	930	02	06	4500	99999
313480002F01	070474	570	04	04	4700	99999
313480002F01	070574	870	01	06	4200	99999
313480002F01	070674	510	02	05	3500	99999
313480002F01	070774	400	03	03	1400	99999
313480002F01	070874	410	02	04	1900	99999
313480002F01	070974	440	04	04	2000	99999
313480002F01	071074	420	03	04	3200	5200
313480002F01	071174	290	01	02	1400	99999
313480002F01	071274	370	01	03	1400	99999
313480002F01	071374	290	02	04	1400	99999
313480002F01	071474	450	06	03	1900	99999
313480002F01	071574	420	04	03	2500	99999
313480002F01	071674	320	02	03	1300	99999
313480002F01	071774	360	03	04	1600	99999
313480002F01	071874	740	02	08	3200	99999
313480002F01	071974	470	03	04	1900	99999
313480002F01	072074	320	02	02	1300	99999
313480002F01	072174	470	03	04	2100	99999
313480002F01	072274	520	03	07	2800	6300
313480002F01	072374	510	01	05	4000	99999
313480002F01	072474	610	01	06	2800	99999
313480002F01	072574	540	99999	06	2700	99999
313480002F01	072674	550	01	07	99999	99999
313480002F01	072774	690	02	07	3100	99999
313480002F01	072874	530	02	06	4700	99999
313480002F01	072974	610	01	04	3000	99999
313480002F01	073074	600	03	04	1600	99999
313480002F01	073174	660	03	06	2100	99999
313480002F01	080174	680	03	06	4200	11600
313480002F01	080274	760	02	11	4400	99999
313480002F01	080374	750	01	03	2100	99999
313480002F01	080474	520	01	02	1400	99999
313480002F01	080574	590	02	03	1800	99999
313480002F01	080674	540	03	06	2800	99999
313480002F01	080774	730	01	07	99999	99999
313480002F01	080874	660	03	05	99999	99999
313480002F01	080974	810	02	06	99999	99999
313480002F01	081074	530	01	04	2400	99999
313480002F01	081174	470	02	03	2700	99999
313480002F01	081274	630	03	06	2900	99999
313480002F01	081374	700	03	09	99999	99999
313480002F01	081474	460	03	03	99999	99999
313480002F01	081574	560	02	04	2000	5900
313480002F01	081674	680	02	07	2500	99999
313480002F01	081774	660	02	05	2600	99999
313480002F01	081874	380	03	03	1300	99999
313480002F01	081974	550	03	06	1900	99999
313480002F01	082074	840	01	09	4000	99999
313480002F01	082174	880	01	08	3900	99999
313480002F01	082274	450	01	06	3300	99999
313480002F01	082374	1010	03	06	3200	99999
313480002F01	082474	660	02	05	3200	99999
313480002F01	082574	540	03	02	1300	99999
313480002F01	082674	920	01	06	2800	99999

313480002F01	082774	1130	02	06	2200	7000
313480002F01	082874	1040	02	06	2800	99999
313480002F01	082974	1100	02	08	4100	99999
313480002F01	083074	780	01	05	1500	99999
313480002F01	083174	1180	03	06	3900	99999
313480002F01	090174	530	05	03	2400	99999
313480002F01	090274	630	01	03	1400	99999
313480002F01	090374	1090	01	08	99999	99999
313480002F01	090474	440	99999	02	99999	99999
313480002F01	090574	860	01	05	1300	99999
313480002F01	090674	780	01	07	3500	99999
313480002F01	090774	830	01	05	1700	99999
313480002F01	090874	770	03	07	4800	99999
313480002F01	090974	1290	02	08	3600	8200
313480002F01	091074	1510	02	07	2600	99999
313480002F01	091174	1430	02	17	5800	99999
313480002F01	091274	1030	01	06	99999	99999
313480002F01	091374	1300	01	06	99999	99999
313480002F01	091474	500	01	02	1300	99999
313480002F01	091574	330	01	03	99999	99999
313480002F01	091674	660	01	04	99999	99999
313480002F01	091774	970	01	09	5000	99999
313480002F01	091874	610	01	05	2300	99999
313480002F01	091974	830	02	07	4900	9800
313480002F01	092074	1580	01	07	4100	99999
313480002F01	092174	970	01	05	3400	99999
313480002F01	092274	370	01	02	1400	99999
313480002F01	092374	380	01	03	1300	99999
313480002F01	092474	950	99999	06	3800	99999
313480002F01	092574	1350	01	07	5000	99999
313480002F01	092674	1400	01	08	6300	99999
313480002F01	092774	1700	02	99999	4800	99999
313480002F01	092874	880	01	99999	3200	99999
313480002F01	092974	610	01	99999	2300	99999
313480002F01	093074	510	01	99999	99999	99999
313480002F01	101074	600	01	04	2600	99999
313480002F01	100274	420	01	04	3400	3200
313480002F01	100374	440	99999	03	1500	99999
313480002F01	100474	1330	01	03	3600	99999
313480002F01	100574	1190	01	99999	8600	99999
313480002F01	100674	750	02	99999	6200	99999
313480002F01	100774	1020	01	99999	99999	99999
313480002F01	100874	850	01	05	3300	99999
313480002F01	100974	1180	01	07	5600	99999
313480002F01	101074	1030	01	08	99999	99999
313480002F01	101174	1040	01	08	4900	99999
313480002F01	101274	1090	01	08	4400	99999
313480002F01	101374	430	01	04	2800	99999
313480002F01	101474	440	01	03	99999	99999
313480002F01	101574	820	01	04	99999	99999
313480002F01	101674	490	99999	99999	99999	99999
313480002F01	101774	1290	99999	99999	99999	3800
313480002F01	101874	490	01	04	1700	99999
313480002F01	101974	620	01	04	2700	99999
313480002F01	102074	300	01	02	99999	99999
313480002F01	102174	99999	99999	99999	99999	99999
313480002F01	102274	99999	99999	99999	99999	99999
313480002F01	102374	99999	99999	99999	99999	99999
313480002F01	102474	99999	99999	99999	99999	10500
313480002F01	102574	99999	99999	99999	99999	99999

3134B0002F01	102674	99999	99999	99999	99999	99999
3134B0002F01	102774	99999	99999	99999	99999	99999
3134B0002F01	102874	750	99999	99999	99999	99999
3134B0002F01	102974	99999	99999	99999	99999	99999
3134B0002F01	103074	1110	01	08	99999	99999
3134B0002F01	103174	1820	01	07	8400	99999
3134B0002F01	110174	1430	01	06	5900	99999
3134B0002F01	110274	940	01	03	2000	99999
3134B0002F01	110374	900	01	03	3500	99999
3134B0002F01	110474	1360	01	05	4800	99999
3134B0002F01	110574	99999	99999	99999	99999	99999
3134B0002F01	110674	600	01	02	99999	99999
3134B0002F01	110774	640	01	02	3400	3700
3134B0002F01	110874	800	01	99999	99999	99999
3134B0002F01	110974	590	02	02	2600	99999
3134B0002F01	111074	550	01	02	99999	99999
3134B0002F01	111174	550	99999	99999	99999	99999
3134B0002F01	111274	620	99999	99999	99999	99999
3134B0002F01	111374	1420	99999	99999	99999	99999
3134B0002F01	111474	1160	99999	05	6B00	99999
3134B0002F01	111574	660	01	04	99999	99999
3134B0002F01	111674	750	01	05	7900	99999
3134B0002F01	111774	770	99999	08	14900	99999
3134B0002F01	111874	1350	01	07	99999	99999
3134B0002F01	111974	1620	01	20	14600	8400
3134B0002F01	112074	1370	01	05	6500	99999
3134B0002F01	112174	700	01	03	3500	99999
3134B0002F01	112274	560	01	03	1800	99999
3134B0002F01	112374	1310	01	07	7200	99999
3134B0002F01	112474	1270	01	08	9200	99999
3134B0002F01	112574	1180	01	06	7100	99999
3134B0002F01	112674	490	01	02	1300	99999
3134B0002F01	112774	1010	01	05	5200	99999
3134B0002F01	112874	370	99999	05	11800	99999
3134B0002F01	112974	550	01	03	4100	99999
3134B0002F01	113074	560	01	05	5400	99999
3134B0002F01	120174	210	02	02	99999	99999
3134B0002F01	120274	210	01	02	99999	4200
3134B0002F01	120374	180	01	03	99999	99999
3134B0002F01	120474	190	01	03	3100	99999
3134B0002F01	120574	1010	99999	06	9700	99999
3134B0002F01	120674	1470	99999	08	16500	99999
3134B0002F01	120774	740	01	06	11300	99999
3134B0002F01	120874	480	02	02	2800	99999
3134B0002F01	120974	670	01	03	4500	99999
3134B0002F01	121074	210	01	03	5000	99999
3134B0002F01	121174	660	99999	99999	99999	99999
3134B0002F01	121274	1010	01	06	5700	9500
3134B0002F01	121374	750	99999	07	8300	99999
3134B0002F01	121474	260	99999	99999	99999	99999
3134B0002F01	121574	120	99999	99999	99999	99999
3134B0002F01	121674	480	01	02	6500	99999
3134B0002F01	121774	630	99999	03	99999	99999
3134B0002F01	121874	360	99999	03	6300	99999
3134B0002F01	121974	560	99999	03	9700	99999
3134B0002F01	122074	760	99999	04	7700	99999
3134B0002F01	122174	300	99999	05	11200	99999
3134B0002F01	122274	320	99999	03	99999	99999
3134B0002F01	122374	1120	01	04	99999	99999
3134B0002F01	122474	520	99999	07	7200	99999

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3134B0002F01 122574     280       01        03      4900    99999
3134B0002F01 122674     360       01        03      4700     6600
3134E0002F01 122774     660    99999        04     10200    99999
3134E0002F01 122874     240       01        04      5000    99999
3134E0002F01 122974     240    99999     99999     99999    99999
3134E0002F01 123074     600    99999        03      6600    99999
3134E0002F01 123174    1100    99999        04      8000    99999
99
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